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Table of Contents

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ORIGINAL ARTICLES— Page

Occupational Health: The Need for Group Industrial Medical Clinics, by Alan Bell 449
The Place of Radiotherapy in the Treatment of Diseases of the Skin: Historical Aspects, by W. W. Lempriere 452
The Place of Radiotherapy in the Treatment of Diseases of the Skin: Benign Conditions, by Eric H. Taft 454
The Place of Radiotherapy in the Treatment of Diseases of the Skin: Malignant Conditions, by D. M. Clarke 456
The 100 Day Basal Body Temperature Graph in Early Pregnancy, by Alan Grant and W. G. McBride 458
Further Observations on Oxytocin and Oxytocic Substance, by R. W. Hawker, C. F. Walmsley, V. S. Roberts and P. A. Robertson 460
Aviation Medicine at Home and Abroad, by Wing-Commander J. McC. Morrison 461
Treatment of Paraplegia in a Rehabilitation Centre, by G. A. McLean 464
The Bulbous Nose, by Graham Humby 466

REVIEWS—

Pathology for the Physician 467
What You Can Do for Angina Pectoris and Coronary Occlusion 467
The Individual Psychology of Alfred Adler 467
Laboratory Medicine: Hæmatology 467

NOTES ON BOOKS—

The Penguin Song Book 468

BOOKS RECEIVED 468

LEADING ARTICLES—

The Fulbright Act and Australia 469

CURRENT COMMENT—

Plaster of Paris 470
Dog in a Sputnik 470
Psychiatry in the British Army in the Second World War 471

ABSTRACTS FROM MEDICAL LITERATURE— Page

Orthopædic Surgery 472
Physical Medicine 472

MEDICAL PRACTICE—

Queensland Medical and Associate Professions Superannuation Plan 474

MEDICAL MATTERS IN PARLIAMENT—

Senate 475
House of Representatives 475

OUT OF THE PAST 476

CORRESPONDENCE—

Robert Gordon Craig 476
Osteoarthritis and Lumbo-Sacral Pain 476
The Hæmophiliac at School 477
Acute Otitis Media in Children 477
Medical Technology Convention 477
Psoriasis: A Physician's Evaluation 478
Work for the Handicapped 478
Œsophageal Hiatus Hernia 478

NAVAL MILITARY AND AIR FORCE—

Honours 478
Appointments 479

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA 479

POST-GRADUATE WORK—

Royal Prince Alfred Hospital: Ear, Nose and Throat Department 480

AUSTRALIAN MEDICAL BOARD PROCEEDINGS—

Queensland 480

DEATHS 480

DIARY FOR THE MONTH 480

MEDICAL APPOINTMENTS: IMPORTANT NOTICE .. 480

EDITORIAL NOTICES 480

OCCUPATIONAL HEALTH: THE NEED FOR GROUP INDUSTRIAL MEDICAL CLINICS.[1]

By ALAN BELL,

Director, Division of Industrial Hygiene, Department of Public Health, New South Wales.

> Good human relations in industry can only be surely founded on a treatment of each individual as a human being of infinite value, whose welfare in the highest sense must be regarded as an end in itself.—SIR GEORGE SCHUSTER, C.B.E., M.C., British financial expert.

ONE hundred and twenty-eight years ago a Yorkshire employer made arrangements for a medical officer to visit his factory daily, to determine whether the health of the children he employed was being adversely affected by their work. It is a far cry from this appointment—probably the first industrial medical officer in the world—to the comprehensive schemes which one can see in many of the large factories of America and Great Britain. For example, the medical department of the Pressed Steel Company at Oxford is staffed by two whole-time doctors, 13 nurses, a physiotherapist, a laboratory technician, a radiographer and a dentist in addition to clerical staff; 12,000 people are employed in this factory. I wish to add that many progressive, similar-sized Australian industries have comprehensive medical departments; such well-known names as Broken Hill Proprietary Company Limited and General Motors-Holden, to mention but two, rapidly spring to mind in this connexion. The modern day personnel officer, industrial doctor and safety engineer are the logical successors to the charitable Christian factory owner of the eighteenth and nineteenth centuries. In those days the manager was much better able than now to study personally the troubles and qualities of his employees.

The President of the National Safety Council of Australia said in the foreword to the 1958 Annual Report: "The most heartening aspect of this year is the great upsurge of interest in safety and the realization that accident prevention is important both from a humanitarian and economic point of view."

In these days of highly-competitive markets, a nation's ability to sell goods depends upon the fullest productivity of each and every worker. Production increases result, not only from improvements in managerial techniques, but also from the bettering of working conditions and the physical well-being of those employed. I submit, Mr. Chairman, that doctors working in industry should vitally concern themselves with preventive medicine, and not be content with the narrower concept of first-aid work and medical examinations—important though this work may be.

This ideal can be achieved only if the policy of top management is such as to demolish ruthlessly barriers which prevent the doctor from having free access to any part of the factory. Unfortunately, all too frequently

[1] An address delivered at the first National Conference of Industrial Safety, held at Canberra on September 26 and 27, 1958.

he is "confined" to his clinic either by design or by pressure of work. Initial contracts should be drawn up in such a way that the physician (i) has a reasonable amount of time left for inspection of the working environment, (ii) must be consulted when significant alterations in production techniques or new chemicals are introduced, (iii) is actively encouraged to seek the help of his State Industrial Hygiene Unit whenever he considers that its specialized laboratory facilities may be of help in the assessment of whether or not an occupational health hazard exists. It is no good lead poisoning being diagnosed if the source of the trouble is not found and removed. As an example, I could quote a recent case in which a medical colleague of mine noticed that employees, working in a particular section of the factory, were constantly asking for aspirin tablets. His investigation showed that the cause of the headaches was the inhalation of solvent fumes from unventilated open containers. I could enumerate numerous similar instances in private industry, in some of which, unfortunately, it required considerable tact and perseverance on the doctors' behalf before they were even allowed to visit the jobs in question—let alone make recommendations. I regret to say that in some establishments that I have visited, safety is regarded as the sole prerogative of one officer. I hope that everybody here will agree with me when I say that an effective safety programme frequently requires team work. We all have something to contribute towards the common goal.

To what extent do doctors help to reduce the over-all accident rate of this country? I am afraid that their contribution is not large; it cannot be otherwise, because the number of medical men working in this field is very small. In 1955 The Royal Australasian College of Physicians, in a Report of the Committee Investigating Occupational Health in this country, estimated the total at about 190, of which only eight were full-time officers. According to the latest Commonwealth Official Year Book, there were 51,056 registered factories for the period 1954-55; in other words, a medical average of only 0·19%. I do not think that the position has improved much in the last two or three years; the above-mentioned percentage will, no doubt, surprise many of you, but I hasten to add that the corresponding figure for Great Britain is very little better—namely, 0·56%.

What are the reasons for such a poor percentage? It is primarily connected with the size of the average factory. Statistics show that in all industrialized countries, by far the greater share of the total labour force is employed in small factories. Australia is no exception, as can be seen from the data in Figure I.

For obvious reasons, in the main economic, large factories engage a doctor's services much more frequently than smaller ones. This is a pity, because in many instances working conditions are less satisfactory in the latter class; it is here, of course, that the doctor can do most good. The truth of my earlier statement is well illustrated by the results of a fairly recent survey on this subject carried out in the United Kingdom (Table I).

The figures in Table I show that it is only factories with more than 250 employees which have a reasonable medical coverage.

It is common knowledge that the industrialization of Australia is proceeding at a rapid pace. The figures in Table II speak for themselves.

A breakdown of recent yearly totals reveals that the major share of the increase in the total labour force is still occurring in the small factories (Table III).

If this trend continues, and there is every indication that it will, then in the years to come my estimated medical average of 0·19% will be smaller still, because the over-all industrial growth of the country will constantly outpace the number of firms making adequate individual medical arrangements. I would like to submit Mr. Chairman, that this problem is one which industry should now be facing up to, and which should be exercising the minds of managers and trade union leaders alike. This appears to be the case overseas. I should like to outline briefly some of the steps which have been taken to overcome this deficiency in far off countries. These may be divided into two classes—namely, the legislative approach and the voluntary one. Each have had their successes.

The Legislative Approach.

The provision of adequate medical services has been tackled in this manner in a number of countries, e.g., Belgium, Brazil, Japan and Peru. France probably has

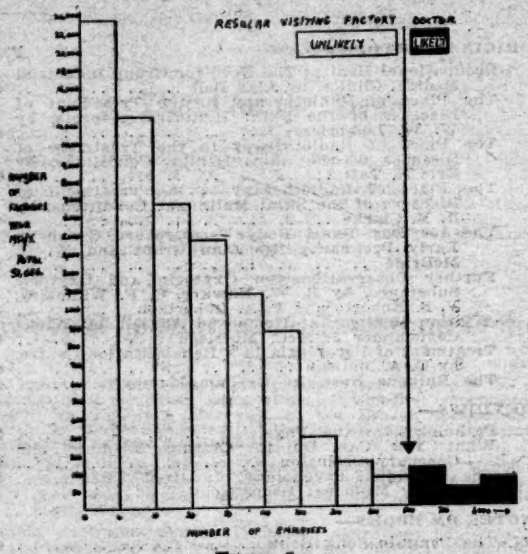

FIGURE I.

the most comprehensive scheme of all; there a health and safety committee must be formed in all factories employing more than 50 people, and the doctor must be a member of this committee. As already implied, each establishment, irrespective of size, must engage the services of a doctor for weekly specified periods, the duration of which varies according to the size of the plant. This sliding scale of attendance hours is such that a full-time physician is necessary if the factory employs more than 2500 persons. The law states that small factories must combine together to provide a group service. The appointed doctor is required to submit regular reports about certain aspects of his work, not only to the factory manager, but also to the Ministry of Labour. The physician must also regularly inspect the different manufacturing processes in his factory.

TABLE I.

Results of a Survey of Factories in the United Kingdom.

Number of Workers.	Percentage of Total Factories.	Percentage of Factories with Medical Service.
Less than 26 ..	83·0	0·4
26 to 50	4·4	2·4
51 to 100	4·3	4·1
101 to 250	2·0	10·0
Over 250	2·0	41·0

This detailed compulsory scheme has, if one can judge from the literature, been very successful, although it is not one which I would care to consider seriously, in its entirety, as being suitable for this country. I believe, provided progress is made, that the better scheme is the one which results when management, unions and doctors get together voluntarily, and jointly plan a suitable service. This has already been done in several countries, and I would like to describe briefly some of the more important

and more successful schemes. My examples, taken from three countries, have been deliberately picked to show how it is possible to approach a common problem—the provision of adequate medical services for small factories—in different ways.

VOLUNTARY SCHEMES.

Norway.

In 1946, an Industrial Medical Services Council was formed, representing the Norwegian Federation of Labour, the Employers' Association and the medical profession.

TABLE II.

Increase in the Number of Factories and Employees, 1901 to 1955.

Year.	Number of Factories.	Number of Employees.
1901	11,143	198,000
1938–1939 ..	26,941	565,000
1949–1950 ..	41,596	917,000
1954–1955 ..	51,056	1,031,000

One of the functions of this body is to draw up standards for comprehensive in-plant health services. Factories which participate in this successful voluntary scheme are registered, but before this is possible, it is necessary for the firm in question to engage the services of a general practitioner. As in France, the number of hours he must attend at the factory depends upon the size of the establishment. A full-time doctor is needed if there are between 2000 and 4000 workers.

TABLE III.

Increase in the Number of Small Factories and Employees, 1945 to 1955.

Number of Employees.	Number of Factories.			
	1945–1946.	1949–1950.	1953–1954.	1954–1955.
1 to 50 ..	28,547	38,441	46,377	47,711
51 to 100 ..	1352	1674	1657	1727
Over 1000 ..	54	64	70	74

Great Britain.

Over the past few years, several schemes have been tried. It might well turn out that there is no ideal standardized scheme, and that modifications have to be made to a basic plan to meet varying local conditions.

Central Middlesex Hospital.

The Nuffield Foundation recently generously provided a sum of £16,000 to initiate a scheme whereby an industrial health service is to be established at the Central Middlesex Hospital, a major London teaching hospital. Within half a mile of its boundaries there are 250 factories; the full-time occupational health consultant of this new unit will try to institute a service designed not only to treat accidents, but also to prevent industrial diseases and improve working conditions. This development of an extra-mural service by a hospital is, I think, of particular interest, and one which should be carefully watched.

A somewhat similar industrial health service is to be established in Newcastle-on-Tyne; this will probably be jointly run by Durham University's Department of Industrial Health and by the Regional Hospital Board.

Bedford Engineering Medical Service.

The Bedford Engineering Medical Service scheme originated in 1943, when an engineering firm approached the local branch of the Engineering and Allied Employers' National Federation with a request to make available, to each of the 10 member firms, the services of a medical officer. Eventually, the Federation decided to employ a doctor full time, and to arrange for him to visit each factory on a roster. This scheme, exclusively for engineering factories, is run by a mangement committee, and now caters for the medical needs of about 7000 employees. Apart from providing the conventional accident treatment service and investigating industrial diseases as they arise, such as dermatitis or asbestosis, the group recently collaborated in an investigation carried out by the Department for Research in Industrial Medicine of the Medical Research Council; the object of the project was to determine the incidence of Raynaud's phenomenon in grinders of small metal castings.

Trading Estates.

An interesting development in the Old Country has been the setting up of group medical services to look after the workers on various trading estates. Three schemes, namely those at Slough, Hillington and Bridgend, are now well established. The first is probably the best known, and I would like to outline briefly some of its major points.

The Slough scheme was jointly sponsored in 1947 by the Nuffield Foundation and by the Slough Social Fund. The total number of member firms is 179, which in January, 1957, employed between them 17,748 men and women. Each factory pays the central fund an annual subscription of one guinea per head of employees. However, I believe that the actual running costs are higher than this; the balance is made up by contributions from the Ministry of Health and the Nuffield Trust. The whole service is managed by representatives of employers, workers and some interested outside bodies.

The organization consists of a central polyclinic, two dressing stations situated on the periphery of the trading estate, a mobile well-equipped dressing station and medical departments in six of the major participating firms. In addition to facilities for X-ray examination, physiotherapy and chiropody, there is a large residential rehabilitation centre situated in beautiful surroundings at nearby Farnham Park. A close liaison with the Department of Labour ensures the subsequent satisfactory placement of disabled workers.

Throughout the years that this service has operated, the full-time medical director has built up a close association with the local general practitioners. Between 3000 and 4000 medical examinations are performed yearly; many are carried out to assess physical fitness of workers for certain specified jobs. A pleasing feature is the increasing number of routine examinations being carried out on executives; in England, as here, this is an important new aspect of industrial medicine.

Attached to the scheme is a social service department, which is under the supervision of a trained medico-social worker. This person investigates the many social, economic and domestic problems which affect the workers' health and, where possible, tries to obtain whatever help is necessary.

In 1950, an occupational hygiene team was also established within the organization. In 1957, this unit carried out a wide range of investigations within the factories of this trading estate; problems associated with the use of toxic agents such as benzene, lead, mercury and ozone—to mention but a few—were solved.

Harlow Industrial Health Service.

Harlow is one of the new English towns; the first house was occupied in 1949, and the first factory came into production about two years later. In 1957, 35,000 people lived in the town, 7000 of whom worked in 51 factories, producing a wide variety of products ranging from cosmetics to electronic computors. After preliminary inquiries, the Harlow and District Industrial Employers' Group decided to start an industrial health service, and accordingly set up a non-profit-making company without share capital. As provided by the Articles of the company, the management of the service is vested in its Council, which has 22 members. One of the main differences between the Harlow and the Slough scheme is that local general practitioners, aided by a senior visiting medical officer, work the medical side of the service on a part-time

basis. Each factory is visited at least once a week. The success of this new venture may be judged from the fact that recently this scheme opened its own dermatological and orthopædic clinics.

Two other interesting facts of the service are an attempt to try to cover similarly (*a*) Harlow's large and vigorous building industry, and (*b*) the many distributive trades in the area.

Once again, without the generosity of the Nuffield Provincial Hospital Trust, this service would probably not have come into being; individual firms pay an annual subscription per employee ranging from five shillings to ten shillings, depending upon whether or not a nurse is employed at the factory in question.

Future Schemes.

A few years ago, the Minister of Labour and National Service set up a standing Industrial Health Advisory Committee to survey the industries of various towns to try to find suitable areas for additional schemes similar to those already described. Two of the initial areas chosen for study were Halifax and Stoke-on-Trent; as far as I know, no definite proposals have yet been produced.

New Zealand.

Compared with Australia, New Zealand is not a heavily industrialized country; their factories total 20,488 (205,287 employees). Nevertheless, they have had, for a number of years, three group industrial health clinics situated at Auckland, Christchurch and Dunedin; a fourth, which will be an outpost of the Penrose Clinic in the first-named city, is soon to be erected. I was instrumental in organizing one of the group clinics in the South Island, and am satisfied as to the worth and value of this type of medical coverage.

I understand that future policy is for the Department of Health to provide the sites for any new clinics; capital costs for further centres will be equally shared by the Workers' Compensations Board and by the Industrial Welfare Deposit Account, whereas maintenance charges will be equally proportioned between the three organizations.

What is Happening in Australia?

As I have previously pointed out, the number of part-time or full-time industrial doctors is extremely small. In Sydney, several individual industrial doctors visit numerous factories, often in widely-scattered suburbs. For example, one group of four have on their "list" more than 50 factories—a total of 14,000 employees. This group employs two safety officers. Such private enterprise is admirable. It is also true that many other firms (the exact number is impossible to determine) have made arrangements with nearby doctors to attend to their serious accidents or to undertake specific statutory medical examinations—such as are required, for example, under the 1956 Lead Process Regulations in New South Wales. The latter arrangements seriously fall short of the suggested ideal as recently defined by a Joint International Labour Office and World Health Committee of experts. They said that occupational health services should aim at the "promotion and maintenance of the highest degree of physical, mental and social well being".

During the recent forty-second session of the Industrial Labour Conference in Geneva, the sixth item in the agenda was the "Organisation of Occupational Health Services in Places of Employment". This meeting stated that the functions of an occupational health service could be divided into 12 groups. These are as follows. (*a*) Surveillance, within the undertaking, of all factors likely to affect the health of the workers, and advice to the management and the representative of workers and their trade unions in this respect. (*b*) Surveillance of the hygiene of sanitary installations and other facilities for the welfare of the workers of the undertakings, such as kitchens, canteens, day nurseries and rest homes, and surveillance of any dietetic arrangements made for the workers. (*c*) Pre-employment, periodic and special medical examinations—including, where necessary, biological and radiological examinations—prescribed by national laws or regulations, by agreements between the parties or organizations concerned or considered advisable for preventive purposes by the industrial physicians, such examinations to ensure particular surveillance over certain classes of workers such as women, juveniles, workers exposed to special risks and handicapped persons. (*d*) Compilation of statistics concerning health conditions in the undertakings. (*e*) Study of or participation in job analysis in the light of hygienic, physiological and psychological considerations, and advice to the management and workers on the best possible arrangements of jobs, having regard to these considerations. (*f*) Surveillance of the adjustment of workers to their jobs and, in appropriate cases, of their rehabilitation and retraining, and advice in this respect. (*g*) Advice to the management and workers in connexion with the placing or reassignment of workers. (*h*) Emergency treatment in case of accident or indisposition, as well as, in certain circumstances and in agreement with the parties concerned, ambulatory treatment of employees who have returned to work or have not been absent from it. (*i*) Initial and regular subsequent training of first-aid personnel, and supervision and maintenance of first-aid equipment in cooperation, where appropriate, with other departments and bodies concerned. (*j*) Participation, with other appropriate departments and bodies in the undertaking, in the prevention of accidents and occupational diseases and in the supervision of personal protective equipment and of its use, and advice to the management and workers in this respect. (*k*) Education of the personnel of the undertaking in the field of health and hygiene, and advice to individual workers, at their request, regarding any disorders that may occur or be aggravated in the course of work. (*l*) Research in the field of occupational health, or participation in such research in association with specialized services or institutions.

To those of you who have, or are considering engaging, a doctor on your staff, I suggest that it might be profitable to compare your doctor's duties with those listed above; in this way you will be able to determine whether or not you are making the fullest use of your medical man-power.

From what I have said, it will be obvious that, on the question of industrial medical services, there is room for much improvement in both Great Britain and Australia; both have a totally inadequate over-all coverage. The main differences between the two countries is that in England bold and imaginative schemes are being tried in an attempt to find the correct solution to this problem. Unfortunately, this is not so here, and I submit, Mr. Chairman, that it is time to tackle this problem. Professor Lane, Nuffield Professor of Occupational Health, University of Manchester, in a presidential address to the Occupational Health Section of the Royal Society for the Promotion of Health, recently said: "The promotion of health in industry is essentially the concern and responsibility of industry itself. . . . The industrial manager and the trade union leader have responsibilities for industrial health which they alone can discharge." I fully agree with his remarks.

THE PLACE OF RADIOTHERAPY IN THE TREATMENT OF DISEASES OF THE SKIN: HISTORICAL ASPECTS.[1]

By W. W. Lempriere,
Melbourne.

There is always an air of expectancy about a medical congress which brings men from afar, either to tell or to hear some new thing. There is no such air of novelty about the present symposium, which promises neither to break new ground nor even to cover the entire field of existing knowledge.

It is not our purpose to discuss the science of radiology in general or to usurp the functions of the Section of

[1] Read at a meeting of the Section of Dermatology, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

Radiology at this Congress. But there are some who do not realize that the use of radiotherapy in various forms has been accepted by dermatologists for over half a century as a most valuable adjunct in the treatment of a wide variety of conditions — so potent a weapon, so easy to apply, that the great questions of "when" and "how" must be answered, not only in terms of pure physics, but in terms of experience and skill.

And yet to many of the public at large, and even to some professional men, radiotherapy retains a certain air of mystery and suspicion. "Is it all as good as they say it is?" "Wouldn't something else be better?" Added to all this there has descended on the world the fear of the atomic bomb. Every now and then the most reasonable and intelligent patient will lose his sense of proportion and show panic at the mere suggestion of a little X-ray treatment.

For these reasons, therefore, it was thought that the time was ripe for a brief review of a well-established practice, in the light of past experience and modern knowledge — namely, the place of radiotherapy in the treatment of diseases of the skin.

One need not do more than remind you of the romance of discovery, from the first stunning announcement of the X rays by von Röntgen in 1895 to the systematic research that enabled Professor and Madame Curie to isolate radium three years later. The power to penetrate opaque objects and tissues was the first to excite attention. The therapeutic value was unsuspected and was investigated only after the first reports were received of damage to the skin from over-exposure. Yet X-ray therapy had begun within 12 months of von Röntgen's discovery, and radium treatment followed after the famous Becquerel burn in 1901. The potentialities of the new treatment flashed upon an astonished world — an excited, credulous, industrious world — and the race was on.

The discovery that X rays were not bactericidal was a keen disappointment; for it seemed that the most obvious use for these penetrating rays would be in the treatment of pulmonary tuberculosis. The other great targets were the treatment of cancer and the angiomata and the removal of superfluous hair; but in the first ten years nearly every chronic disease was empirically treated. Medical journals were full of wonderful reports, and warnings against indiscriminate treatment tended to be overlooked. Owing to the low output and low voltage of the early X-ray tubes, the destructive effects of over-exposure, both of patients and of operators, were slow to develop and slower to be recognized, even by the martyrs such as Hall-Edwards, until a great wave of pessimism and keen disappointment supervened from 1906 to 1912.

Such recessions, of course, are salutary in the long run. Great technical advances had to be made in the design and construction of X-ray machines, and clearly it was essential to develop some reliable method of measuring X-ray output, while a long period of patient clinical assessment was necessary to determine the *modus operandi* and the most appropriate uses of radiation in its various forms.

But indeed there has been something more than patient observation; there has been a positive driving force that we may well accept as genius, which has directed these advances and raised certain men above their fellows — men such as Wickham and Sabouraud, Sequeira, Kienböck, McKee, and in our own country Herman Lawrence and Molesworth. These men were great in any company and the world may well be thankful to them. The history of these advances is a most interesting study and is in no sense a haphazard development. We now enjoy the outcome of 60 years of concerted scientific endeavour, and the wisdom of those who have served a long apprenticeship in the art of its clinical application.

This consolidation of experience enables us to act with some confidence in the use of radiotherapy. Whatever may be the advantages of one form of radiation over another in any particular case, the essential requirement is that we shall be able to administer the right dose of radiation uniformly and reliably in the right place at the right time for our particular purpose, remembering Kienböck's dictum that "the degree of reaction depends on the quantity of radiation absorbed by the tissue".

It was found very early that various tissues — normal, inflamed or neoplastic, parenchymatous, vascular or connective — differed greatly in their sensitivity to radiation, and it is this differential sensitivity that enables us to exert a depressing effect on some abnormal tissues with a minimum of damage to the normal.

One is well aware of the limitations and the hazards of radiation and takes good care to avoid them as far as possible. The most formidable hazards, apart from local injury to the skin, are damage to the blood-forming tissues and to the glandular tissue of the gonads, with the immediate threat of sterility and the long-term risk of mutation of the genes.

It should be realized, of course, that the unit of measurement of radiation, the Röntgen unit, or *r*, is a quantitative, not a qualitative measure, and that secondary radiations, such as "back-scatter", are mostly softer and less penetrating.

At the risk of some duplication with the succeeding papers, it is as well to summarize what useful effects we have thus learnt to expect from radiotherapy of the skin. The first is destruction of tissue, particularly malignant tissue. This, to many minds, is the sole purpose of radiotherapy, because mighty institutions have arisen with the prime object of treating cancer — which is not in any way the subject of this paper, except where the skin is concerned. Sometimes, without being actually destroyed, a particular type of cell may become so "devitalized" that its power to grow or to metastasize is inhibited. The second and quite different effect, with much smaller doses of radiation, is a reduction of inflammatory erythema, depending largely on its action on small blood vessels. Thus, in many indurated and congested lesions, erythema fades and capillary permeability is apparently altered, so that brawny induration is rapidly reduced. For example, one moderately large dose of X-ray therapy within this range can hasten dramatically the resolution of a large brawny carbuncle or the early stages of herpes zoster without having any direct effect on the actual infective element.

Another useful effect of radiation is the rapid reduction of certain round-celled infiltrations of the dermis, as in lichen planus, and in these the patient is conscious of a welcome relief from the irritation.

Other conditions again, such as acne or rosacea, require the prolonged effect of small doses repeated over a period, to make the most of the differential sensitivity.

Much of this in the past has been largely empirical, with the skill and judgement born of long practice playing a large part in its success; but nowadays there are few giants in the profession sufficiently rooted in the past to be able to say "in my practice" rather than "McKee or Sulzberger says so", and bold enough to pursue radiotherapy to its full advantage in the light of their own experience. For, of course, the age of specialization has long been upon us. The whole field of radiotherapy has assumed more than human proportions — and indeed it is a jealous god. One cannot afford to be an amateur radiotherapist.

On the other hand, however, the cult of higher mathematics and the concentration upon the individual lesion tend to neglect the clinical assessment of the patient as a whole and the "natural history" of the disease. One has seen gross hyperkeratoses almost heal by making the patient eat underdone meat; and it is surely wrong to talk about the treatment of a rodent ulcer without considering the associated chronic solar dermatitis. In deciding on treatment, one cannot afford to neglect the valuable help of sound clinical observation, which ought to be the long suit of the dermatologist.

The different sources of radiation available have been developed according to the effects required, from the delicacy of the radium plaque to the versatility of superficial X rays, then filtered radiation, contact therapy (Chaoul's tube), low-voltage X rays (Grenz ray), and radioactive substances such as thorium X. In the products of the cyclotron we now have a whole series of isotopes. Strontium, for example, emits beta rays and may be useful for superficial application. Other elements, such as iodine and phosphorus, appear to offer certain advantages for systemic use owing to their affinity for certain tissues, but not particularly in relation to the skin except perhaps with the reticuloses such as mycosis fungoides. Radioactive cobalt, which promises such help with deep-seated tumours, emits radiation comparable with supervoltage X rays—not really useful where a purely superficial effect is required.

In the field of post-war medicine there has been great activity, both in the production of quite new series of drugs acting in quite new ways, and at the same time in quite new concepts of the natural history of disease. Many time-honoured clinical beliefs have been held up to the light and shaken; many supposedly water-tight compartments in pathology and in diagnosis have been broken down. We no longer possess a comfortable sense of security about anything. But one must be thankful for new trains of thought which point the way towards better understanding, and for new types of drugs, particularly the antibiotics and corticosteroids, which have a profound but by no means a fool-proof effect on many of the conditions in which X-ray treatment has proved useful. The anti-inflammatory action of hydrocortisone, though often comparable or complementary, is by no means identical with that of the X rays.

In this critical atmosphere it is the opinion of most practising dermatologists that radiotherapy in its various forms still holds an important place in the treatment of a great variety of skin conditions, and in the training of dermatologists a practical knowledge of radiotherapy in this particular aspect is essential. The Diploma in Dermatological Medicine of the University of Sydney requires a thorough course of instruction in the theory and practice of radiotherapy of the skin. But medicine is still an art, and human nature is still a fascinating study; and one returns to the conclusion that the application of even so severely technical a weapon as a beam of X rays will achieve its greatest success under personal supervision, assessed in conjunction with any other forms of treatment appropriate to the case in hand.

THE PLACE OF RADIOTHERAPY IN THE TREATMENT OF DISEASES OF THE SKIN: BENIGN CONDITIONS.[1]

By Eric H. Taft,
Melbourne.

Radiology as a broad subject, as an art and as a science has been developed by physicists, biologists, radiologists and dermatologists, and progress has been so rapid and varied that it has been almost impossible for any one person to master the entire subject.

Practical cutaneous radiology has been developed by dermatologists and is an integral part of dermatology. A dermatologist should make the diagnosis and know whether or not a given dermatosis is amenable to radiotherapy. He will be acquainted with the indications and contraindications for therapy and with its complications and sequelæ. He should know how much radiation in terms of dosage to apply, when to begin, when to stop, and what results to expect. In other words, he is an expert in the use of radiotherapy for diseases of the skin. Cutaneous radiotherapy belongs to dermatology, and there it should remain if dermatologists keep abreast of advances made in this field by physicists, biological scientists, etc.

Advances in radiotherapy in recent years include the increasing use of low-voltage and Grenz-ray therapy, and of radioactive isotopes, including thorium X, phosphorus and strontium. Because of the low depth dose, low-voltage forms of therapy and Grenz radiations have some advantages, but their extensive use has been retarded by the difficulty of ensuring accurate calibration.

Although Low-Beer (1954) has pointed out the advantages of radioactive isotopes in their simplicity of application, their homogeneous irradiation, the extreme flexibility of the source and the comparative superficiality of the depth dose, we are unlikely to parallel overseas experience until the facilities of an atomic pile are available in Australia.

In this country, benign conditions of the skin are treated by superficial X-ray therapy generated by 60 to 130 kilovolts and by radium and its degradation products. Sulzberger *et alii* (1952), in an exhaustive follow-up of 1000 patients and an equal number of controls, have shown that with the use of superficial therapy in the fractionated doses and qualities employed by dermatologists, X-ray sequelæ are not produced by total dosages of 1000*r* or less.

Although ionizing radiations have been used to irradiate biological material for 50 years, knowledge of the mechanism by which the rays act on the living cell is still far from complete. The point of attack on any living organism must be the cell; hence the primary biological effect of radiation must be that of cellular injury. Small doses inhibit cellular function, and large doses produce cellular destruction. Changes in the cell as the result of radiation can be produced directly by its effect on the cell constituents, or indirectly by its action on the matrix or the vascular supply of the cell, or by interference with cellular nutrition.

Various cells differ in their radio-sensitivity, and to generalize broadly it is believed that this sensitivity is proportional to their proliferative activity and inversely proportional to their degree of differentiation.

Diseases which are the result of functional or productive over-activity are favourably influenced by radiotherapy, and because the action of radiotherapy is predominantly inhibitory it is in ilicated mainly in anaplasia, hyperplasia and hypertrophy rather than in atrophy and dystrophy.

To simplify the position, we may classify the effect of radiation in benign dermatoses into four groups, as follows: (i) cellular nutrition changes: more pronounced in young and active cells than in mature and quiescent ones; (ii) inhibition and atrophy of cutaneous appendages: hair, nails, sebaceous glands, sweat glands and apocrine glands; (iii) modification of environment: a less favourable medium for growth of bacteria and fungi; (iv) antipruritic effect.

The Indications for Radiotherapy.

In the past there has been scarcely a dermatosis for which radiotherapy has not been advocated; but in recent years the indications for its therapeutic use have undergone great change. New treatments are constantly arising, and many cutaneous diseases respond better to conventional dermatological therapy than to irradiation. This is scientific progress, the result of creative research and observation, and is to be encouraged. The object of radiotherapy is to cure or relieve signs or symptoms and, in benign dermatoses, to do so by a quantity of radiation which produces no permanent injurious effect on the skin or the rest of the body.

The benign dermatoses in which radiotherapy is of accepted worth are set out in the following list, which is alphabetical and does not represent either the order of frequency of use of therapy or its efficacy: acne, angiomata, deep fungous infection, infective dermatoses (furuncle, carbuncle), dermatitis herpetiformis, eczema, epilation,

[1] Read at a meeting of the Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

hidradenitis and hyperhidrosis, hypertrophic scars and keloids, lichen simplex chronicus, otitis externa, pruritus, psoriasis, pyogenic granuloma, sebaceous cyst, synovial cyst, seborrhœic dermatitis, warts.

I have deliberately omitted keratoses and keratoacanthomata — not because I believe these conditions to be malignant, but because they are better dealt with in the section of this symposium on malignant conditions, particularly from the aspect of differential diagnosis. I shall deal with only a handful of the common dermatoses in this formidable list on the basis of the four main therapeutic effects of radiotherapy enumerated above, with the full knowledge that more than one mode of therapy may operate in a particular condition.

Cellular Nutrition Changes.

Angiomata.

I shall deal only with cavernous hæmangiomata, as the "port-wine stain" responds poorly to any treatment, and "spider" nævi are best treated by diathermy.

The natural history of many angiomata is that of spontaneous involution, and because of this there are considerable differences of opinion regarding their treatment. However, an occasional cavernous hæmangioma may undergo ulceration, hæmorrhage and considerable scarring, and a few do persist into adult life.

Because early lesions are lined with embryonic cells which are extremely sensitive to irradiation, and those lining the capillaries in the adult lesion are mature and insensitive, dermatological opinion is inclined to the view that cavernous hæmangiomata should be treated on diagnosis. Carbon dioxide snow, diathermy, injection of sclerosing solutions and plastic surgery all have their advocates. X-ray therapy and radium (and radon moulds) seem to have the advantage of simplicity of administration, painlessness and complete control of dosage, and are the treatment of choice in suitable cases at an early age. Single doses of 200*r* do not damage an underlying epiphysis.

The aim of treatment is to stimulate the natural and spontaneous tendency to vascular sclerosis, and to do so at the earliest possible stage.

Warts.

These tumours represent an extremely common virus infection of the skin, the course of which is completely unpredictable. One cannot say whether the lesions will be single or multiple, or whether they will respond to any particular type of therapy or disappear spontaneously. Suggestion therapy may cause them to disappear, and occasionally treatment of the so-called "mother wart" may produce resolution of the satellite warts. It seems clear that any method of treatment would be successful in a reasonably high percentage of cases because of its psychotherapeutic effects alone.

Thus the initial or early use of radiotherapy to destroy or inhibit embryonic cells in the stratum germinativum or to alter the environment of the growing virus in an inimical manner seems to be contraindicated. Suggestion therapy and destructive chemical treatment or diathermy should be used in the first instance.

Psoriasis.

Radiotherapy undoubtedly produces temporary involution in psoriasis, but the disease is a chronic one, and in general X-ray therapy is contraindicated. Perhaps the only indication for its use may be in the treatment of exposed areas for purely cosmetic reasons for that very important "once in a lifetime" social engagement, such as a wedding, etc.

Grenz radiation has been advocated for this type of chronic condition, but considerable conflict of opinion exists with regard to its effect as compared with superficial radiotherapy.

Inhibition of Cutaneous Appendages.

Acne.

Although the occurrence of plugged follicles with the complications of rupture of the follicular wall, pyogenic infection and foreign-body reaction is well appreciated in acne, the condition is basically a hormonal imbalance, which is a stimulus for its development.

Because of the management of the hormonal stimulus at present largely eludes us, the condition is treated by the local application of agents which desquamate the skin, suppress glandular activity and control infection. Resorcin, sulphur and salicylic acid are used in gradually increasing concentrations in order to achieve on optimum clinical effect; mechanical trauma — picking and squeezing — by the patient is stopped, and dietetic changes, particularly the elimination of chocolate and fatty foods, are made.

X-ray treatment is believed to act by suppression of glandular activity and pyogenic infection. Although X rays have been so favoured by dermatologists as a treatment for acne that their use is almost routine and automatic, a recent trend has been to use this modality less and less. It is best not used before the age of 17 years, and stopped on the early sign of erythema or pigmentation. In mild cases, an excellent cosmetic result is obtainable by local treatment alone; but in severe cases with a tendency to early and widespread scarring, the use of X rays should not be withheld.

There is no place for radiotherapy in acne if the local management is poor or inadequate, or if the patient is allowed free use of greasy cosmetics and uninhibited gorging of chocolate.

Hyperhidrosis.

In its localized form, particularly on the palms and soles and in the axillæ, increased sweat secretion presents a formidable challenge to therapy. When general medical causes such as pyrexia, thyrotoxicosis, drugs, etc., are excluded, it is regarded as a manifestation of an anxiety state.

Although radiotherapy has been used for a long time in the treatment of this distressing complaint, radiation given by means of a technique to obtain an adequate depth dose and thus inhibit sweat-gland activity would produce skin damage. The use of radiotherapy would seem to be unjustified — and, incidentally, the results of sympathectomy somewhat disappointing.

Treatment by the local application of astringents, sedatives and, recently, the exhibition of atropine or atropine-like drugs which interfere with acetyl-choline production, is often sufficient to relieve the condition.

Epilation.

Radiotherapy is a simple and safe means of producing temporary epilation.

The vast majority of cases of tinea capitis in this country are produced by *Microsporon lanosum*, and local therapy is adequate to achieve a cure.

In the rare and resistant infections, or when home or environmental conditions are not conducive to adequate local therapy, temporary epilation by radiotherapy is indicated.

Epilation of the beard area in sycosis barbæ when local treatment has failed may be needed to achieve a cure. The causative organism is often *Staphylococcus aureus*, and more and more organisms are becoming resistant to antibiotics because of the widespread and often unjustified use of these agents.

Modification of Environment.

The use of radiotherapy in infective dermatoses has decreased since the introduction of bactericidal and fungicidal agents and antibiotics. In coccal infections, a breakdown of the mechanism of surface disinfection of the skin has occurred, and radiotherapy accelerates the evolution

and involution of furuncles and carbuncles. The action of radiotherapy may be a direct one, either altering the environment unfavourably for future bacterial growth or destroying microorganisms. It may be indirect, effecting the liberation of chemical defensive agents from phagocytes.

It is important to treat the infected area by local means and to limit the spread of infection; it is most important to find and treat any focus of infection, such as the nasal vestibule, adequately and for a prolonged period.

Antipruritic Effect.

Although the antipruritic effect of radiotherapy has been recognized for a very long time, its mechanism is not well understood. This is scarcely to be wondered at, as our understanding of pruritus itself, despite the work of Shelley and Arthur (1957), is incomplete.

Localized areas of pruritus may develop on certain regions of the body — the nape of the neck, the inner sides of the limbs, etc. — and this condition is known as lichen simplex chronicus (localized neurodermatitis).

In the ano-genital area pruritus is common and, when local causes and general disease, diabetes, etc., are excluded, is regarded as being of neurogenic origin and a form of localized neurodermatitis.

In "eczema" — the term being used in its morphological sense — patches of pruritic skin are common.

Radiotherapy seems to be of great value in reducing inflammation, achieving non-specific desensitization of the skin and, by allaying itch, allowing vesiculated areas to dry up.

Radiotherapy has been widely used in the treatment of localized pruritus, but recently the tendency has been to use it less frequently in chronic and long-standing disease. It is valuable in controlling the extreme paroxysms of irritation; but the local application of antipruritic agents, sedation, prevention of friction and adequate investigation into what the Americans call the "life situation" are essential parts of management.

All these conditions have a variable natural history, and psychogenic factors play a paramount role in their production and perpetuation.

In recent years topical steroid therapy has been greatly used in pruritic conditions, and in many ways has revolutionized management in what previously were intractable cases. The effect, broadly speaking, is anti-inflammatory, and although this may mimic that of radiotherapy it is not necessarily identical and indeed may even be complementary.

Some Criticisms.

The claims to effectiveness of radiotherapy should not be based on the enthusiasm of the manufacturer or on its early users, however eminent. It is unfortunate that only in recent years has an attempt been made to subject topical medication in general and radiotherapy in particular to serious scientific assessment.

Some doubt has been passed on the efficacy of X-ray therapy by Crissey and Shelley (1952) in America, and by Twiston Davies (1956) in Britain. For example, it has been suggested that X-ray therapy at present is of less value in pruritus than it has been in the past, and that the older gas tubes with coil and mercury break produced elements in the beam, absent from present-day apparatus, of great therapeutic value. However, the evaluation of X-ray therapy in non-destructive doses is complicated by its psychotherapeutic potentialities in the lay mind, as well as by the variable natural history of the disease being treated.

Warnings about the dangers of being "shackled to a shadow" have long been accepted in diagnostic radiology; we should also take heed of the dangers in being "tied to a tube".

Conclusion.

There seems little doubt that radiotherapy has a place in the treatment of benign dermatoses and is a potent and simple remedy in many diseases.

Its use is governed by the knowledge, experience and clinical judgement of the dermatologist, who will also treat the patient as a whole and employ the many and varied alternative and associated treatments, both local and general, that he considers necessary.

Radiotherapy is part of, and not a substitute for, the art of dermatology.

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THE PLACE OF RADIOTHERAPY IN THE TREATMENT OF DISEASES OF THE SKIN: MALIGNANT CONDITIONS.[1]

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It has been thought advisable to list those conditions which may lead to malignant change in the skin. The following list is based on those of McKee and Cipollaro (1937) and of Belisario (1954).

- Keratoses—solar (senile), arsenical, occupational (tar, pitch, oil, arsenic), seborrhœic (seborrhœic or senile wart).
- Cutaneous horns.
- Chronic solar dermatitis (sailor's or farmer's skin).
- Keloid.
- Cicatrix.
- Long-standing ulceration (leg ulcers), sinuses, fissures and fistulæ.
- X-ray and radium dermatitis or ulceration.
- Occupational hazards (sunlight, heat, trauma, scars, arsenic, coal tar and its derivatives, naphthalene, soot, embedded foreign bodies, ionizing radiations).
- Leucoplakia.
- Nævi—true nævus-cell-containing lesions.
- Sebaceous cysts.
- Syphilis (leucoplakia, glossitis, scars).
- Lupus vulgaris.
- Lupus erythematosus.
- Von Recklinghausen's neurofibromatosis.
- Xeroderma pigmentosum.
- Erythroplasia of Queyrat.
- Bowen's disease.
- Keratoacanthoma (molluscum sebaceum).
- ? Cheilitis glandularis.

Of these precanceroses, some give rise to malignant change on rare occasions only (e.g. von Recklinghausen's neurofibromatosis and sebaceous cysts) and may be left alone without treatment of any sort apart from surgical removal for cosmetic reasons. In others, such as lupus vulgaris, lupus erythematosus and radiation sequelæ, irradiation treatment is absolutely contraindicated. There remain the following for which irradiation may be con-

[1] Read at a meeting of the Section of Dermatology, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1959.

sidered as a possible mode of therapy: keratoses, including seborrhœic wart, cutaneous horns, keloid, leucoplakia, keratoacanthoma, erythroplasia of Queyrat, and Bowen's disease.

The majority of senile or solar keratoses are best removed by some means other than irradiation. Preference varies, of course, but many dermatologists use electrodesiccation or cryocautery for these lesions. (Cryocautery is pure carbon dioxide snow in pencil form or carbon dioxide snow mixed with acetone within a special applicator, or the same mixture as a slush painted on the lesion.) Dermabrasion, the technique of wire-brush surgery in which a rapidly rotating brush or burr is used to grind off the lesion down to the upper dermis, may also be employed.

It is true that solar keratoses may be successfully removed by irradiation. My own policy is to reserve irradiation for keratoses only in areas of the skin which may be subject to wetness and infection because of the occupation of the patient—e.g. on the hands of doctors and workers in wet occupations—and for those with an infiltrated base. I have never been quite able to make out the reason for the routine use these days of the beta rays of a radium plaque as treatment for solar keratoses, although I have seen hundreds of successful treatments by this means.

The overwhelming majority of solar keratoses need not be treated at all, apart from cosmetic considerations. In fact they are not treated at all, as even cursory observation of the skin of one's fellow countrymen reveals. The tedium to the patient of frequent attendances for fractionated radiotherapy to keratoses, the over-zealous follow-up reminders in the mail with the further attendances that result, and the pre-treatment biopsy, which is almost never necessary, are some undesirable features of radiotherapeutic management of harmless keratoses in certain hands. It is only after due consideration and from personal experience of a sufficient number of examples, and with respect, that I make this criticism of some radiotherapists in private and institutional practice.

Cutaneous horns, really an unusually hyperkeratotic variety of keratosis, are more likely to become malignant than keratoses and should always be destroyed. They may be treated in the same way as keratoses. In either case my impression is that better cosmetic results are obtained more often by such means than by scalpel surgery. Many will have a different view, no doubt.

If, after removal by means other than radiotherapy of the horn itself, there remains an infiltrated raised base or collar one centimetre or more in diameter, I prefer to treat this with irradiation.

Seborrhœic warts are best removed by cautery, diathermy or cryocautery. Healing is quicker and cure more certain than with irradiation.

No treatment apart from excision and grafting will ablate an old white keloid. In the early stages, when the lesion is soft and pink, Belisario's figures indicate that the best results are achieved by a combination of X-ray therapy and intralesional injection of hydrocortisone and hyaluronidase.

Small areas of leucoplakia up to half a centimetre in diameter may be treated by cautery, diathermy or cryocautery; but larger areas, which take a longer time to heal after these techniques, as well as these small areas, disappear completely and without a too unpleasant healing phase after irradiation with X rays or the gamma rays of radium or radon.

Erythroplasia, occurring classically on the glans penis and prepuce, but also described as occurring on other mucous surfaces, requires adequate surgical, not radiotherapeutic, treatment. However, some authorities prefer combined surgery and radiotherapy. The same management applies to Bowen's disease.

Keratoacanthoma or molluscum sebaceum is said to become malignant on occasions. As this is very uncommon, if it occurs at all in true keratoacanthoma, local destruction is all that is required. If left untreated, the lesion usually subsides spontaneously in a few months. However, it is best to get rid of it, because it is nearly always on an exposed area, and more scarring follows spontaneous healing than removal. Cutting it off to the base with light diathermy to stop bleeding will suffice. Resolution appears to be quicker and the eventual scarring less if an immediate small dose of X-ray therapy is also given. The dose required is insufficient of itself to cause cosmetic sequelæ.

There is universal agreement that the benign nævus-cell-containing lesion often known as a pigmented or non-pigmented mole should not be treated by irradiation. The same view is taken with regard to malignant melanoma of the skin by almost all authorities in relation to the primary tumour. Nevertheless, some radiotherapists consider that secondarily involved lymph nodes respond better to combined radiotherapeutic and surgical management, or at least they will employ irradiation for the secondary deposits in lymph nodes and even for the primary lesion when operation is contraindicated or declined. Dr. R. Kaye Scott, of Melbourne, claims some measure of success in this last type of case. Even if only an occasional success results, the radiotherapeutic attempt would appear justifiable with such a hopeless prognosis.

For the sake of completeness, there should also be mentioned sarcomata arising in the dermis, such as lymphosarcoma, fibrosarcoma and Kaposi's sarcoma. Rarely cure appears to follow surgical treatment or radiotherapy, but at best these are merely palliative, and recurrences are the rule.

While the skin lesions of many reticuloses are frequently radiosensitive for a period of time, X-ray therapy generally provides only temporary palliation. Mycosis fungoides affords a typical example. Unfortunately, the earlier hopes of arrest or improved palliation from radioactive isotopes in this and other reticuloses have yet to be fulfilled.

In Paget's disease of the skin treatment is surgical. Palliative radiation treatment of other types of carcinomatous or sarcomatous secondary deposits invading the skin may at times be justified to make the patient's remaining lease of life less ghastly.

The remaining malignant primary tumours of the skin are basal-cell carcinoma and squamous-cell carcinoma. There is some doubt as to whether true "mixed" forms exist. It may reasonably be held that the dermatologist is best placed to select the treatment of choice for these primary skin cancers, being committed by his training to place excessive emphasis neither upon scalpel surgery nor upon radiotherapy, and being familiar with forms of treatment of cutaneous tumours other than scalpel surgery and radiotherapy.

The aim of any type of management is primarily complete eradication. In achieving this, consideration should secondarily be given to the cosmetic result and to socio-economic features of the individual case. No attempt will be made to discuss the arguments for and against each method in various types of lesions in various situations. I can merely outline my personal preferences.

Very small lesions (i.e., up to four or five millimetres in diameter) which do not extend into the dermis are removed by diathermy, cautery or cryocautery, with the most satisfactory cosmetic result. This applies especially to basal-cell carcinoma around the nose and adjacent parts of the cheeks, areas where surgery and radiotherapy do not achieve their best results. Early small superficial recurrences after surgery and especially after radiotherapy are also treated by these means.

There is no alternative to scalpel surgery in the following types of basal-cell or squamous-cell carcinoma: scalp lesions, except in bald areas, because of alopecia following irradiation; lesions on the hand of those whose work involves the danger of trauma to the irradiated site; recurrence after irradiation and new primary growths, situated so close to a previously irradiated area that

further irradiation would be applied to the area of past irradiation; lesions involving cartilage and bone, in which reconstructive surgery will give a better cosmetic result—e.g., involvement of a large portion of the ear or the nose; a bad cosmetic result, such as permanent hyperpigmentation, telangiectasia or atrophy resulting from the use of a proper radiotherapeutic technique on a previous occasion; lesions in which the amount of previous exposure of the area to ionizing radiation is suspected of contraindicating an adequate cancericidal radiotherapeutic technique. Finally, there is no alternative when the patient insists on scalpal surgery. I consider it unwise, for medico-legal reasons, to attempt to dissuade a patient from such a desire.

With the above-mentioned exceptions, the remainder of the primary basal-cell and squamous-cell carcinomata of the skin are treated by dermatologists and radiotherapists with irradiation, with completely satisfactory results. Surgeons also treat them with completely satisfactory results. The cure rates are statistically the same by either means, taken by and large. The cosmetic results by either means vary between excellent and bad. One can only deplore the tendency for each specialist to exaggerate the defects of the alternative technique, and to illustrate his point by showing bad results at meetings and in lectures or by published works. Such activity can only be decried as an attempt to solve, by biased advocacy, a problem suitable for an impartial scientific approach.

It is just as correct to excise a lesion surgically, with certain cure and excellent cosmetic result, as it is to treat it by irradiation, with an equally good result and the same degree of certainty. However, socio-economic factors also enter into the question. The almost-forgotten radium plaque is ideal for certain small cancers in the treatment of patients bedridden at home. A cancericidal single dose of X-ray therapy at the time of consultation is the answer for many patients living at long distances. In most cases, the expense, the inconvenience, the period of stay in hospital and the patient's preference for a non-surgical treatment weigh heavily in favour of radiotherapy as against plastic surgery. I am not alone in thinking that the cosmetic results of proper radiotherapy, especially around the face and head, are preferable to those of plastic surgery.

Those who employ radiotherapy should know when to employ the various types of beam best suited to the malignant condition. The range is wide, from the "super soft" beryllium window or Grenz rays up to the filtered rays of radium or the linear accelerator.

THE 100 DAY BASAL BODY TEMPERATURE GRAPH IN EARLY PREGNANCY.

By Alan Grant and W. G. McBride,
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It has been known for many years that the basal body temperature becomes elevated during pregnancy, and the historical background of the subject has been ably reported by Palmer (1949). It is remarkable that a more detailed study of this peculiar physiological phenomenon has not been made during the 90 years that have elapsed since the subject was first brought to the notice of the Obstetrical Society of London by Squire (1868).

Van de Velde (1930) noticed that there was a relation between the oscillations of this temperature and the occurrence of ovulation, and many clinical applications of this observation have been recorded (Grant, 1949).

All clinicians are now aware of the fact that there is a biphasic variation in the basal temperature of normal women between one menstrual period and the next, so that the level of the temperature is higher after the occurrence of ovulation than it was before that event.

The Normal Curve in Pregnancy.

The level of the temperature for 14 days after ovulation is similar to that found in the non-pregnant and ovulating woman. However, when the patient becomes pregnant, the temperature fails to fall when menstruation would normally have occurred. The menstrual period is missed, and the level of the temperature remains elevated at the same level as in the thermal phase for the previous 14 days or rises even higher to a level of about 99° F. It is maintained at this level for several months, after which it slowly drops. The progesterone that causes the temperature elevation in the first place continues to increase during the pregnancy, and the reason for this fall in the level of the temperature during the second trimester of pregnancy is not yet explained.

The 100 Day Basal Body Temperature Graph.

During the course of the investigation of the problem of recurrent abortion, it became obvious that the patients who developed a good basal body temperature (B.B.T.) graph for 80 to 100 days after the onset of their pregnancy rarely aborted, whereas those who exhibited erratic levels of temperature often did miscarry. We decided to check this impression by carrying out a planned programme of clinical research.

Material and Method.

A series of women who were subject to recurrent abortions, were requested to take their temperature chart for 100 days after conception. The results are set out in Tables I and II. Many of these patients came from our private practice, and the remainder from the sterility clinic of the Women's Hospital, Crown Street. Most of these women were already carrying out a programme of pre-conceptional therapy, with the use of oral progestogens, as a separate series of investigations had demonstrated that about two-thirds of our habitual aborters of the first trimester type had defective secretory endometrium prior to their pregnancy. This defect took the form of either physiological immaturity of the entire membrane, or disparity in the maturity of the glands and the stroma. Our findings, therefore, are similar to those in America of Hughes *et alii* (1950) and of Jones *et alii* (1956). The result of these pre-conceptional tests will be published separately, illustrating the relationship between the endometrial defects and the post-ovulatory levels of the thermal shift of the B.B.T. chart.

All temperature readings were taken *per rectum* before rising, drinking or smoking in the morning. A note was made of any event that may produce a faulty reading, such as a cold or a late night or an excessive imbibition of alcohol.

Results.

The end results of this regimen are best illustrated in the form of two tables.

It will be observed that the late pregnancy salvage rate in the group who had a good graph was 89%, and the salvage rate in those with a bad graph was 52%.

In Table II the end results are shown for those patients who had a poor graph after conception. Forty patients who had such a poor graph were treated, and 23 were available as a control series. When no treatment was given, 35% had live babies, whereas if progestogens were given post-conceptionally in an attempt to elevate the temperature to a normal height and shape, 62% produced a living infant.

Discussion.

It is our impression that the post-conceptional level of the temperature for the first trimester is more likely to be maintained at a satisfactory height if the thermal shift prior to pregnancy was either normally elevated or made normal by repetitive therapy with progestogens administered orally during the pre-menstrual 10 days. It will be necessary to collect many more charts before this idea can be proved or disproved.

In order to discover whether this pre-conceptional therapy is indicated, it is essential to have performed a pre-menstrual curettage during some previous month, and to have had the tissue "dated" by an expert pathologist. During that same month, a B.B.T. graph must be recorded, and the results of this double pre-conceptional investigation are set out as in the following example: post-ovulatory day by B.B.T. graph—9; post-ovulatory day by pre-menstrual biopsy—5. In this example there is a four-day gap between the real post-ovulatory day and the physiological post-ovulatory day. A disparity of more than two days is regarded as abnormal, and pre-conceptional oral progestogen therapy is indicated. There is no fixed dosage of either progestogens given orally or progesterone given by injection,[1] as the rule adopted is to give enough of one or both to keep the thermal level flat and elevated at least three-fifths of a degree above the pre-ovulatory standard for that particular patient.

TABLE I.

One-Hundred-Day Basal Body Temperature Graphs after Conception.

Type of Graph.	Total Number of Pregnancies.	Miscarriages.	Ectopia.	Still-births.	Live Births.	Pregnancy Salvage Rate.
Poor	63	29 (46%)	1	—	33 (52%)	52%
Good	79	8 (10%)	1	—	70 (89%)	89%

TABLE II.

Poor One-Hundred-Day Basal Body Temperature Graphs after Conception.

Condition of Patients.	Total Number of Pregnancies.	Miscarriages.	Ectopia.	Still-births.	Live Births.	Pregnancy Salvage Rate.
Treated	40	15 (38%)	Nil	Nil	25 (62%)	62%
Untreated ..	23	14 (61%)	1	Nil	8 (35%)	35%

The relationship between endometrial defects in maturity and the role of disparity between the secretory gland and its stroma are still under active discussion throughout the world. It has always been difficult to reconcile the observations of histopathologists that about 50% of developing ova are abnormal with the pregnancy salvage rate that can be attained by any interested clinician, which is well in advance of 50%. The implication is that 50% of ova were not genetically abnormal, but that some of them went wrong during their early growth. One of the factors most likely to affect them is a deficiency in their endometrial environment, which is the "soil" in which they develop.

Whether or not this so-called nidation factor assumes an important ætiology in sterility and abortion will be resolved only after much more experiment. In the meantime, the 100 day post-conceptional B.B.T. graph is offered to those in clinical practice as a method which appears to work, irrespective of any hypothetical debate about why it does so.

Objections have been made about patients being allowed to record a large number of B.B.T. graphs on the ground that they tend to become obsessed about them. We aim to achieve a compromise between the extremes of graphs being taken for too long and not being taken at all. The B.B.T. graphs must be recorded on suitable paper. A list of temperature readings written in a small notebook is a waste of everybody's time.

[1] "Primolut N" kindly supplied by A. G. Schering, Berlin.

The graph is of greatest use in the case of recurrent aborters of the first trimester variety, but it may be found an aid in any instance in which it is important to guard against the onset of a miscarriage. This post-conceptional 100 day B.B.T. graph is worthy of an extended trial in many places by many people, as it appears to be a simple aid to those patients who wish to prevent the occurrence of yet another miscarriage. Recording the B.B.T. should be commenced before the actual pregnancy begins, that is, it should start from the period preceding conception.

In a small series to date, the results are much better when the pre-conceptional progesterone treatment of habitual abortion has been faithfully applied.

We have heard these charts criticized on the grounds that "some patients carry on to term even if their B.B.T. chart is erratic for the first three months of their pregnancy". This generalization is quite correct, but a reference to the tables will show that only about one-third of such patients procure a live baby, whereas if the B.B.T. graph is normally and evenly elevated during that time, the number of babies obtained rises to almost 90%. This represents a significant difference in the salvage rate of babies.

We should like to emphasize one observation about the B.B.T. graphs recorded by women who suffer from recurrent miscarriages in the first three months of pregnancy. Many of them will be abnormal in height, in length or in shape, but every few months it is common for one to be recorded that is quite normal. If the patient should become pregnant during one of these cycles when ovulation is normal, the pregnancy is most likely to proceed normally, and whatever treatment has been administered for that month will be given the credit for the success. We suggest that this presence of occasionally normal ovulation amongst a series of abnormal cycles is one of the main reasons why so many and so varied treatments have been claimed as successful in habitual abortion of the first trimester type.

We should stress that our findings have a special sphere of application, and apply only to those women who have so-called "unexplained" and repetitive miscarriages during the first trimester of a series of pregnancies.

Summary.

1. The basal body temperature graph was used to record the waking temperature for 100 days after the onset of pregnancy.

2. If the graph was elevated to 99° F. or to a height at least three-fifths of a degree above the usual level before ovulation, the pregnancy salvage rate was nearly 90%.

3. If the graph was not adequately elevated, the pregnancy salvage rate was only 35%, when no treatment was given.

4. It is our impression that pre-conceptional correction of endometrial deficiencies in habitual aborters was more likely to be followed by a normal post-conceptional graph for 100 days, and by a higher rate of pregnancy salvage. The investigations relevant to this statement have not yet accumulated in sufficient numbers to prove or disprove this suggestion beyond any doubt.

5. The 100 day post-conceptional basal body temperature graph is a useful clinical method of prognosis for those patients suspected of a tendency to abort. The cost to the patient is one thermometer and a piece of graph paper only, whereas pregnanediol studies are relatively expensive and chemically cumbersome.

Acknowledgements.

We wish to acknowledge the work of our pathologist, Dr. Murray Moyes, in reporting on the status of the secretory endometrium, and the assistance of Dr. R. Mackey and Sister Johnson of the Sterility Clinic, The Women's Hospital, Crown Street, Sydney.

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FURTHER OBSERVATIONS ON OXYTOCIN AND OXYTOCIC SUBSTANCE.

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WE have previously reported finding oxytocin and oxytocic substance (O.S.) in extracts of blood from men, women, sheep, cows, goats and rats (Hawker and Robertson, 1957*a*, 1957*b*; Hawker and Roberts, 1957; Hawker, 1958; Hawker and Robertson, 1958*a*, 1958*b*; Hawker, Walmsley, Roberts and Robertson, 1958; Hawker, Roberts and Walmsley, 1958).

This substance (or one closely resembling it) has also been extracted from the hypothalami of various species (Robertson and Hawker, 1957, 1959; Duggan and Reed, 1958).

In a paper which was recently published in this Journal (Hawker and Robertson, 1958*b*), we reported some of the physico-chemical and pharmacological properties of this unidentified oxytocic substance. At that time we were not able to distinguish between O.S. and a number of polypeptides with closely similar actions—viz., bradykinin, kallidin, substance U and substance Z. We now have evidence which suggests that O.S. is not to be confused with these polypeptides, and this evidence is presented in this paper.

Methods.

Preparation of Kinin.

Kinin was produced by the action of human urinary kallikrein on dog's plasma.

Inactivators present in the plasma were destroyed by incubation of the plasma at pH 2 and 37°C. for ten minutes. It was then neutralized and dialysed for four to six hours against running tap-water. Human urine was dialysed for 24 hours against running tap-water. An amount of 0·5 millilitre of this urine was added to 1·0 millilitre of the treated plasma and incubated at 37°C. and pH 7·3 for 15 minutes. The reaction was stopped by pouring the mixture into boiling alcohol (80%). The alcohol extract was evaporated to dryness and the residue taken up in distilled water (Horton, 1958). The kinin preparations were then thioglycollated as described below.

Kinin is most likely the same substance as bradykinin, kallidin, substance U and substance Z; these substances have similar physico-chemical and pharmacological properties.

Preparation of Oxytocic Substance.

Oxytocic substance was prepared as follows:

Samples of blood were collected from the ante-cubital veins of healthy non-pregnant medical students and prevented from clotting by the addition of heparin. The blood was added immediately to acid-alcohol and extracted according to the modification (Hawker and Robertson, 1957*a*) of the method of Bisset and Walker (1954). The possibility of 5-hydroxytryptamine or acetylcholine in the extracts acting as uterine-stimulating substances was removed by dialysis and/or by adding dibenamine hydrochloride and atropine to the organ bath. After dialysis through a "Cellophane" membrane, the concentration of potassium in the extract was estimated directly by a flame photometer, and the amount of this ion contained in the largest doses of extract used was compared with the uterine threshold dose of potassium. In this way 5-HT, acetylcholine and K^+ were eliminated as interfering oxytocic substances in these experiments. A sample of each extract (or in some instances the whole extract) was treated with sodium thioglycollate (0·01 M at pH 7·5 for 30 minutes) in order to inactivate oxytocin (Ames and Van Dyke, 1952). The oxytocic activity (O.A.) of the extracts after this treatment was considered to be due to O.S.

TABLE I.

Indices of Discrimination for $\frac{\text{Kinin}}{\text{Oxytocic Substance}}$

Rabbit Ileum, Rat Uterus.	Guinea-Pig Ileum, Rat Uterus.
60·0	7·4
43·0[1]	13·0
300·0	12·0
5·6	0·6[2]
60·0	1·35
—	20·0
Average 93·52	9·06

[1] Rat blood extract used for an oxytocic substance.

[2] Assayed without antagonists.

Effect of Enzymes.

The enzymes used were pepsin, trypsin, papain, chymotrypsin and carboxypeptidase.

To 3·0-millilitre samples of extract, one or two milligrammes of either enzyme was added, and for pepsin the pH was adjusted to 2·5 and for the others to 7·3. These, together with control aliquots of extract, were incubated at 37°C. for up to six hours. Solutions containing 20 mμ of "Pitocin" and preparations of kinin were treated similarly. The effect of each enzyme was observed in at least five paired experiments—i.e., oxytocin and O.S. were run in parallel, as were O.S. and kinin.

Assay Procedures.

Rat Uterus.—Extracts were assayed for oxytocic activity, oxytocin and O.S. against "Pitocin" (Parke, Davis) on the isolated sensitized uterus of virgin Wistar strain rats, as described by Holton (1948) and by Gaddum, Peart and Vogt (1949).

Guinea-pig and Rabbit Intestine.—Rabbits and guinea-pigs were killed by a blow on the back of the head. A three to four centimetre portion of the upper part of the ileum was suspended, after its lumen had been emptied, in a 10 millilitre organ bath in Mg^{++} – free Tyrode's solution containing 0·10% sodium bicarbonate solution through which oxygen was bubbled. Contractions of the longitudinal muscle only were recorded with a frontal writing lever which had a fivefold magnification.

Results.

Index of Discrimination.

The indices of discrimination for kinin against O.S. are shown in Table I; each active substance was assayed first on the rabbit ileum and rat uterus, and then on the guinea-pig ileum and rat uterus.

Hydrolysis with Enzymes.

The effects of the enzymes used in these experiments on O.S., oxytocin and kinin are revealed in Tables II and III. It is apparent from these results that O.S. differs from oxytocin and kinin. Papain clearly distinguished O.S. from kinin, and carboxypeptidase differentiates between O.S. and oxytocin.

Discussion.

The value of any given pair of tests for discriminating between two active substances can be expressed in terms of the "index of discrimination" (Gaddum, 1955). The index is equal to the ratio of two results which would be obtained if a standard preparation of one substance was used to assay an unknown extract containing the other. As Gaddum states: "When the index is equal to unity the two tests make no distinction between the two active principles and the results suggest that they may be identical."

In each test the index was well beyond unity, thus strongly suggesting that the active principles, O.S. and kinin, are different substances.

TABLE II.

Effect of Enzymes on Oxytocin, Oxytocic Substance and Kinin.

Preparation.	Inactivated by				
	Chymotrypsin.	Carboxypeptidase.	Pepsin.	Trypsin.	Papain.
Oxytocin	+	−	−	−	+
Oxytocic substance ..	+	+	−	−	−
Kinin	+	+	−	+	+

A number of polypeptides which stimulate smooth muscle have been described, and the effects of enzymes upon them (Gaddum, 1955) have been explained.

On the basis of our experiments with chymotrypsin, carboxypeptidase, trypsin, papain and pepsin, it can be confidently concluded that oxytocic substance is most

TABLE III.

Effect of Incubation and Enzymes on Kinin and O.S.

Substance.	Experiment Number.	Average Percentage Loss by		
		Incubation.	Trypsin.	Papain.
Kinin.	1	0	73	97
	2	19	54	70
	3	13	59	53
	4	0	82	97
	5	37	43	71
	6	0	47	96
	7	45	31	32
Mean		16	56	74
O.S.	1	0	0	25
	2	0	0	5
	3	0	0	7
	4	25	16	26
	5	0	0	3
	6	0	0	0
Mean		4	3	11

probably a polypeptide, and that it is not oxytocin or kinin (bradykinin, kallidin, substance U or substance Z). We have previously shown that O.S. is not to be confused with such other oxytocic factors as potassium, acetylcholine, 5-hydroxytryptamine, hypertensin, vasopressin, pepsitensin, pepsitocin, pepsanurin, pain-producing substance and substance P (Hawker and Robertson, 1958*a*).

Conclusions.

The active principle in our thioglycollated blood extracts has an oxytocic action when tested on the sensitized rat uterus, and is clearly distinguishable from oxytocin and kinin.

It is postulated that it is another oxytocic hormone.

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AVIATION MEDICINE AT HOME AND ABROAD.[1]

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THE dimensions of the medical problems associated with man's activities in the atmosphere and his anticipated ventures beyond are enormous. Engineering miracles, such as the control of nuclear energy and the launching of man-made satellites, have shown that man's occupation of vehicles moving in the outer atmosphere and beyond is only a matter of time. It seems, at the moment, that this time will depend more on the solving of the medical problems than of those associated with pure engineering. The time elapsing before ultimate success, however, will be a direct function of the degree of cooperation between all sciences and disciplines involved.

The purpose of this paper is to describe some of the present-day functions of medical and closely associated sciences in the gaining of safe manning and handling of flight vehicles. Owing to the fact that this comparatively new science of aeromedicine involves so many small facets of other established medical specialities and sciences, a new system of control and cooperation is slowly evolving throughout the world. Aviation medicine has been accepted by the American Medical Association as a separate speciality since 1953. To be rated as an aviation medical specialist by this Association involves some five years' post-graduate study and experience before final examination. The Canadians in this field are endeavouring

[1] Read at a meeting of the Section of Naval, Military and Air Force Medicine and Surgery, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1959.

to gain similar acceptance and standards. Important and new subsidiary specialities are developing among the other sciences, for example, aeronautical engineering and aeronautical biophysics. The human engineer has been described as "one who assists in the design and development of equipment in order that operating and maintenance personnel may perform their tasks safely and efficiently with a minimum of training and selection". He normally has a graduate background of aeronautical engineering, physiology and psychology. The biophysicist is one who has a knowledge of the physical problems involved in biology, and usually has a graduate background in physics and physiology. These are the men who form the backbone for the development of aeromedical science. Many of them are qualified pilots or navigators. This speciality pattern, although names and coordinating efficiency may vary, is similar the world over.

In Australia the increasing growth in complexity and size of military and civil aviation is leading to a similar specializing trend. Both military and civil authorities have seen fit to send many medical and other scientists abroad for study in this field during the last few years. The number of men skilled and interested in aviation medicine and its allied sciences is rapidly growing. The B.M.A. Special Group on Aviation Medicine is assisting in no small way to coordinate the activities of doctors and other scientists in the field. The R.A.A.F., whenever possible, gives medical graduates interested in aviation medicine training as aircrew members. At the moment the R.A.A.F. has two medical graduates who are current jet pilots and one who is a current jet navigator.

The functions of the aeromedical scientist can broadly be divided into two categories: (*a*) the selection, training and routine health maintenance of flying personnel; (*b*) the determination of specific aeromedical problems associated with flight. These subjects will be discussed generally with reference to current overseas thought and development.

The Selection, Training and Routine Health Maintenance of Flying Personnel.

Selection.

One of the most basic problems in flying is the selection of suitable aircrew personnel from the physiological and psychological viewpoints. As aircraft become more complex, demanding from the flyer greater physical and psychological abilities, so standards are gradually getting higher. The percentage of any population which can meet these standards is low. With increasing competition from industry, which requires similar personnel, and a general fear of hazards involved in aviation, the numbers voluntarily presenting for advanced flying training are not increasing. In fact, the numbers presenting for training in military flying are decreasing. Even after the physically unfit and the psychologically doubtful have been eliminated in the selection process, the wastage rate in training remains very high. This high wastage rate is a problem in all parts of the world, and has not been lowered to any significant degree by newer selection methods.

If it is agreed that selection methods will not improve greatly, there will be a world-wide problem in manning the aircraft of tomorrow. Several things may alleviate this problem: (*a*) the increasing health and educational levels in the population; (*b*) a general decrease in flying hazards; (*c*) the design of more easily operated aircraft; (*d*) a lowering of the standard of acceptance for training. There is not time to discuss these factors here, but suffice it to say that flying safety and improved aircraft design are the immediate concern of aeromedical personnel.

The question of the selection of passengers has arisen with military jet aircraft. This is an increasing problem, and may, in time, extend to civilian jet flying.

Training.

For many years aircrew have been instructed by medical personnel on the physiological problems associated with flight, escape from aircraft and survival. They have been taught of the sensory illusions of flight, the effects of accelerations, the effects of hypoxia, the effects of decreasing and altering atmospheric pressure, the physiology of night vision and other physiological problems. They were shown how best to minimize the effects of travelling in this unusual environment. In recent years aircraft development has been such that training of the above-mentioned variety has, of necessity, been increased. In addition, it is now necessary to give the aircrew member a knowledge of pressure breathing, the use of pressure suits, the use of protective clothing including G suits, rapid decompression, and the use of ejection seats.

Throughout the world the majority of this physiological training is conducted by military organizations, but civilian airlines and aircraft manufacturers are now finding it necessary to institute special centres for this purpose. Adequate training of this type demands the use of expensive training aids such as decompression chambers and ejection seat trainers. These aids must be controlled by skilled technicians. Instructional courses are usually managed by suitably qualified medical graduates. In North America, however, they are more often conducted by appropriately trained graduates in physiology.

Instructional staff is trained at one of the world's larger aviation medical centres. Typical of these centres overseas are the R.A.F.'s Institute of Aviation Medicine at Farnborough, the R.C.A.F.'s Institute of Aviation Medicine at Toronto, Harvard University, the U.S. Air Force's School of Aviation Medicine at Randolph and Gunter Bases and the U.S. Navy's School of Aviation Medicine at Pensacola.

Apart from the training of aircrew, nursing staff must be given courses of instruction in the special problems presented by the air transport of the sick and injured. Ground crews must be taught the hazards associated with aircraft maintenance such as noise, jet intakes and tail pipes, ejection seats and liquid oxygen systems.

In recent years, with the exploration and development of the Arctic and Antarctic, aircrews involved have demanded special courses on the medical problems of flight and survival in these areas.

Routine Health Maintenance of Flying Personnel.

The physical and psychological standards required of the flyer on selection must be maintained throughout his flying career. All flyers then are subject to constant surveillance from a medical viewpoint. The nature of this surveillance varies throughout the world, but is steadily increasing in intensity.

More detailed accident investigation has in recent years indicated a necessity for further special investigations during the routine examination of aircrew. Efforts are being made to introduce routine audiometric, electrocardiographic and electroencephalographic examinations. Audiometric examination is now common in the world's flying organizations; however, the standardization and interpretation of the problems involved with the last two examinations are delaying their general introduction.

The necessity for very high standards of visual acuity has reached a peak with the advanced military aircraft of today. Perhaps, in years to come, with greater dependence on instrumental control, those high standards may be relaxed.

The Determination of Specific Aeromedical Problems Associated with Flight.

In order to demonstrate some of the problems of the aeromedical scientist, let us take as examples two hypothetical flight vehicles: (*a*) an aircraft capable of a maximum speed of mach 4·0 and a maximum altitude of 100,000 feet; (*b*) a rocket capable of moving in the outer atmosphere and beyond.

The High Performance Aircraft.

The medical problems presenting from the manning of such an aircraft will arise from the airspeed, the altitude, a combination of the airspeed and altitude, or the control facilities.

Airspeed, as such, presents one major problem, that of the aerodynamic heating of the skin of the aircraft;

for example, an aircraft travelling at mach 4 at 50,000 feet may have an increase in its skin temperature of 1000° F. Should the temperature regulation system of this aircraft's cabin fail at these speeds the result would be disastrous.

Time rate of change of speed or acceleration, on the other hand, is also a big problem. Should the need arise to do a 90° turn with a ten-mile radius at say mach 3, the crew would be subjected to 4 G for about 30 seconds. This is just below the average flyer's black-out tolerance, and if many manœuvres of this variety were executed, would soon lead to extreme fatigue and inefficiency. In spite of the fact that it is aerodynamically difficult to use a small radius of turn in an aircraft of this type, the crew will be encountering small G loadings for long periods even in gentle manœuvres. Fatigue would most certainly be a factor to be reckoned with. This problem has been partially solved in the past by the use of pneumatically operated G suits and a prone position for the crew.

The decrease in atmospheric pressure, associated with the reduction in partial pressure of the oxygen component, leads to the greatest problems associated with ascent. Also the air temperature drops off at approximately 2° C. per thousand feet until it reaches about −56° C. This temperature is reached at about 35,000 feet, and remains approximately the same up to altitudes of 90,000 to 100,000 feet. Now we know that man cannot function efficiently above 10,000 feet without oxygen or above 38,000 feet breathing 100% oxygen. We know also that he is liable to decompression sickness, such as bends and chokes, above 30,000 feet, and that he cannot exist for long exposed to a temperature of −56° C. It is essential then that the occupant be placed in an artificial atmosphere such as that provided by a pressure cabin.

The ideal pressure cabin would be that which could keep the occupant at an equivalent atmospheric level of below 10,000 feet. In order to do this it would be necessary, at the higher operational altitudes of this hypothetical aircraft, to maintain large pressure differentials, which would put great strain on the structure of the aircraft, leading to marked engineering problems in design and weight. Furthermore, should cabin pressurization be lost during operation with high pressure differentials, the rate of decompression may be such as to cause lung damage to the occupants, which may prove fatal. Provided the size of the hole causing the decompression is constant, it can be seen that small cabins such as are seen in fighter aircraft will be decompressed far more rapidly than the large cabins required in bomber and transport aircraft. It has been acknowledged that five pounds per square inch is about the maximum pressure differential for safety in fighter type aircraft. An aircraft operating at 100,000 feet with this pressure differential would still have a cabin altitude of below 30,000 feet, which with temperature regulation would allow all the occupants to operate efficiently whilst breathing oxygen.

A further problem arises above 70,000 feet. Here the density of the ambient air is so low that it becomes an engineering impracticability to compress it. Above this level, then, it seems that it will be necessary to use a sealed cabin with its associated problems including oxygen supply and carbon dioxide absorption. In the event of decompression and exposure of the occupants to the ambient atmosphere, their survival will depend on the rate and extent of decompression, the atmosphere at the altitude to which they are decompressed and the protective equipment being worn. The variety of protective equipment required depends upon the altitude at which the aircraft is to operate. Below 40,000 feet a supply of 100% oxygen is sufficient. Between 40,000 and 50,000 feet this oxygen must be supplied under pressure to the user. Above 50,000 feet some form of pressure suit must be worn. In view of the fact that the development of these suits is still in an extreme state of flux, they will not be discussed.

Now let us consider the problems presented by a combination of speed and altitude. Escape is the main consideration. Above about 250 knots indicated airspeed it is nearly a physical impossibility for the unaided occupant to separate himself from the aircraft without injury. The ejection seat has been introduced and the latest varieties are of a high standard of efficiency. It has been determined, through observations of actual emergency ejections and through the work of aeromedical personnel observing the effects of deceleration using rocket sleds, that the maximum speed at which one can safely eject with the present advanced equipment is about 650 knots indicated airspeed. To escape at airspeeds beyond 650 knots it will be necessary to develop some form of jettisonable all-enclosing capsule. Owing to the high terminal velocity of a body falling in altitude, the parachute opening shock is very high. This, together with the extreme cold and the necessity for the protective clothing mentioned earlier, makes escape extremely hazardous, and stresses the need for as long a free fall as possible with parachutes which open automatically at a low level. In a high performance aircraft, of the type in question, safe control is perhaps one of the most important problems. Here again the weak link in the chain is the man in the cockpit. Manual controls and instrumentation must be simple to operate and interpret. This is mainly the problem of the human engineer.

The Rocket.

Most of the medical problems associated with the high performance aircraft apply also to rocket flight. Let us turn our attention briefly then to some specific medical problems which will arise in our ventures into space. Perhaps the first problem is to supply a sealed cabin enclosing an atmosphere in which man can live. This involves mainly the maintenance of a breathing oxygen supply from within the cabin, removal of the carbon dioxide expired by the occupants and maintenance of a proper temperature. A liquid oxygen supply is probably the most feasible. Carbon dioxide removal can be carried out chemically or physically or perhaps by an enzyme system. The extreme temperatures (hot and cold) to which one may be exposed in space require that a controlled balance between reflectors and absorbers be provided in the cabin.

Of the radiations to which the crew may be exposed, perhaps the most important will be ultra-violet and X rays of solar origin and cosmic rays originating from outer space. The majority of the ultra-violet radiation infringing on the outer atmosphere is absorbed by the ozone layer before reaching the earth. In space, however, where man may be exposed to extreme intensities, the danger from even brief exposures is high. Fortunately, ultra-violet radiation has poor penetrating characteristics, and the sealed cabin should provide sufficient protection. In the same way the "soft X rays" emitted by the sun are easily absorbed by thin sheets of metal. Cosmic rays, however, present the most difficult problem to solve. They are composed of protons primarily and alpha particles (nuclei of helium atoms) and nuclei of heavier atoms. Electrons and gamma rays comprise a negligible portion of the primary cosmic radiation. Cosmic rays are extremely penetrating. Their biological effects on human tissue are produced by radiation either directly or indirectly, striking an atom of tissue and thereby dislodging an electron. The result is a positively charged atom and an electron known as an "ion pair". Hence the radiation is termed "ionizing radiation".

Three types of reaction to ionizing radiation are possible: (*a*) A dense ionizing column of the human tissue may be produced in the path of the radiation strike. (*b*) After the radiation has travelled a certain distance through the tissue it collides with a tissue nucleus. This results in complete disintegration of the radiation projectile as well as of the target nucleus. (*c*) If the range of the radiation entering human tissue is comparatively short, the radiation will escape hitting a tissue nucleus and will spend all its energy in ordinary ionization. This is the most dangerous type of tissue irradiation.

In the study of radiation hazards in space, many variables must be considered—the geographic latitude of

the craft upon exposure (the earth's magnetic field influences the intensity and type of radiation bombardment), the time of exposure, the altitude of exposure and the effect of protective devices. Meteors and meteor dust will present a constant physical hazard. This hazard may be minimized by navigational procedures and perhaps by supplying the craft with a double shell. The phenomenon of weightlessness is the subject of much study. The difficulty of reproducing the zero-gravity state is still hindering the progress of research on human beings. The psychological, victualling and excretory problems of crews travelling for prolonged periods in space are the subject of considerable study in North America at the moment.

Conclusion.

An endeavour has been made to present some of the problems of those people associated with the medical aspects of flight in the atmosphere and beyond.

The growth of the organization, cooperation and training of those involved in the aeromedical sciences has been briefly discussed.

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TREATMENT OF PARAPLEGIA IN A REHABILITATION CENTRE.[1]

By G. A. McLean,

Brisbane.

The reestablishment in work of a paraplegic from spinal cord injury has always offered a challenge to all workers in the field of rehabilitation. It is bound up with the success achieved in the orthopædic, surgical, urological, remedial and vocational care.

Orthopædic treatment is concerned with the initial fracture and later with contractures and splinting. The urological aim of a "dry" bladder depends on satisfactory early bladder care, and later automatic bladder training, which in turn will be influenced by the site of the lesion and the amount of cord or root involvement. Bowel training is also important. The remedial restoration of independence is a function of the Rehabilitation Centre programme. The Rehabilitation Centre in Queensland differs from a paraplegic unit in that it is dependent for orthopædic and urological services on the public hospitals.

The Centre caters for a case load of 100 orthopædic, surgical, medical, psychiatric and adolescent types, and provides speech therapy and prevocational commercial and industrial training leading to vocational training at technical and business colleges, as well as work therapy with a training allowance at approved industrial establishments as a precursor to employment.

Eligibility for rehabilitation must be based on a reasonable prospect of returning to work. This will depend on many factors, including the mastery of elevation, ambulation, daily transport and housing problems, as well as on the patient's skill and potential to return to his previous employment or to learn a new one and live in an area where work is available.

Patients may be admitted to the Rehabilitation Centre as residential patients or on a day attendance basis. Patients of the latter type require motor-car transport to and from their homes, and in the early stages of treatment a medical orderly assists them down the steps at their homes and into the car; but independence is encouraged from the outset.

[1] Read at a meeting of the Section of Physical Medicine and Rehabilitation, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

Rehabilitation patients in residence are faced with local difficulties of terrain. The residential quarters are on two floors, so that until ambulation and stair-climbing are mastered, males sleep, eat, bathe and use the toilet on one floor, while female paraplegics are housed on the first floor beside the main dining rooms.

The remedial therapy departments are situated at a low level on a hillside connected by long ramp paths and steps with the residence at the top of the hill. The patients are transported to and from the residence for therapy by car each morning and afternoon. This may seem complicated; but patients react well to this situation and soon learn to master the problems.

Most of the patients have been complete paraplegics, and the few partial paraplegics have found no difficulties in walking and climbing the levels; in fact, the constant practice produces a great sense of confidence and accomplishment. In the initial stages, firm staff encouragement and the example of older patients soon overcome the retreat into invalidism.

Thirteen paraplegics, including one female, have been accepted for rehabilitation. Their ages have ranged from 16 to 44 years. Two had severe urinary infection and one was incontinent of urine. One had a cervical lesion with partial paraplegia and the remainder had complete low lesions. Two were admitted to the centre in calipers and were able to walk. One (a female) had sat on a bed for 14 months in north Queensland and not used a wheel chair; the other nine patients used wheel chairs in hospitals. One male, in a country town, suffering from severe, widespread bed sores, was accepted for rehabilitation educational and vocational training in book-keeping while under surgical treatment.

Remedial Treatment.

The phase of remedial treatment may be discussed under several headings, as follows.

Splints and Calipers.

In general it was necessary to order strong calipers with safe locking devices, a posterior knee release and a rat trap attached to the sole of the boots. Calipers were ordered for all the wheel chair patients, even the patients admitted with light-weight hospital calipers. There is no doubt that two pairs of calipers will be an asset for every patient, so that when repairs are needed no interruption of treatment or employment will be necessary.

Side locks and anterior thigh releases are effective, but it has been found that the posterior knee ring provides quick control of knee flexion and extension on sitting and rising from a chair. For heavy adults, strong gauge steel seems more serviceable than light duralium and is easily repaired by welding. Toe springs and Capener splints have been replaced by rat traps, because they both cause wear to trousers, which is an expensive item to folk receiving sickness benefit.

Rising and Sitting (Physiotherapy).

While the patients are awaiting the construction of calipers, reconditioning exercises both in wheel chairs and on floor mats help in the development of shoulder and arm musculature. Wheel-chair games such as darts, ping pong, archery and ball games are played. When calipers have been fitted, elevation together with caliper lock manipulation is practised in the walking race.

Ambulation.

Walking is learnt in the walking race by a process of shoulder elevation and latissimus dorsi action with the help of a gravity swing.

Occupational Therapy.

During the wheel-chair period the patient is encouraged to sit near a work bench and commence simple wood-work practice. New crutches are made or sandpapered and polished by the patient himself, so that he develops pride in helping himself.

Later he stands at a bench, strapped to a movable bracket for increasing periods. It is remarkable how

quickly standing in calipers is tolerated when an occupational interest is enjoyed.

Walking.

Four-point crutch walking is the first objective, with double follow-through as the final objective. Balance, speed and agility are the main features. Later, walking is practised on the local footpaths with inclines and downhill slopes. Canadian crutches replace the standard type.

Elevation.

A later requirement is stair climbing. This must be practised first on narrow treads with hand rails until each individual finds his own best method. Some men use one rail and one crutch in the manner of half hopping and half stepping up. Curb practice is also necessary. There are stairways at the centre and with constant practice all the paraplegics have been able to learn to climb the stairs.

Transport Practice.

The low front seat of a "Holden" motor-car has been used to learn entering and alighting from a motor-car. In cases in which finance is available, special adjustments may be made for driving with hand controls; two patients have purchased motorized wheel chairs. So far no paraplegic has used public transport. The average man has little prospect of buying a car. However, from experience gained from the placement of people with paraplegia due to poliomyelitis, the difficulty of transport has often been unexpectedly solved by family or community help or by the finding of work near home.

Wheel-Chair Transport.

The Commonwealth Rehabilitation Service supplies a wheel chair for patients who require one to engage in employment. A chair does enhance speed in frequent office movements.

Bowel and Bladder Control.

Only one patient was incontinent of urine, and he wore a rubber urinal. Replacements were provided by the department. This man suffered from recurrent urinary infection and epididymitis and still requires urological treatment. The recurrences have interfered with his vocational training and prolonged his attendance at the centre.

One patient who suffered partial paraplegia and studied book-keeping under the Rehabilitation Training Scheme held clerical work for two years and then died of urinary infection. Another patient, who could in a wheel chair control his bladder for three-hour periods, had some difficulty when he commenced active stair-climbing to a floor where the usual toilet was not easily available, but he soon adjusted himself and then enjoyed his meals within the general dining-room and other social amenities with other adults at the Centre.

Bowel action was fairly normal in this selected group except in one case; this patient required enemas at regular intervals.

Adjustments to the usual pedestal have been made at the Centre to provide raised high toilet seats, and these are used by both wheel-chair and crutch patients. The chair patients remove the canvas backs of the chairs and move back on the raised toilet seats.

Bathing.

Patients are encouraged to sit under a shower, but some prefer using a bath; for this purpose the Commonwealth Rehabilitation Service provides a low bath seat and hand rails. The simplest adjustments only are used, so that patients may use the ordinary household baths, basins and sinks. Owing to lack of finance, there is little prospect of special housing design for the patients.

Muscular Spasms.

In the early stages of walking practice three patients suffered adductor spasms which often made continuous walking impossible. However, as patients became more confident and stronger they were able to continue walking despite the tremor, and in the end it proved a minor handicap.

Bed Sores.

As was mentioned earlier, one patient is still under treatment for severe bed sores, and his remedial treatment in ambulation has not commenced. However, he is studying and hopes to obtain clerical work at home by community help.

Another man, with healed sacral and gluteal scars and with a long abdominal scar which was the site of a skin graft, has demanded very careful fitting with a pelvic band for his calipers.

Contractures.

No gross contractures have been encountered in this group and this is in marked contrast to many of the poliomyelitis patients.

Other Considerations.

Housing Arrangements.

In the selected group there were four patients who did not have a permanent home. One has been settled in a housing area about four miles from the city, but his transport problem has been solved by the purchase of a motor-car which is driven by his wife, and when his urinary infection has been controlled it is hoped that he may secure clerical work.

Another man lives at a public hospital and goes to work in a wheel chair. He returned to his skilled occupation of draughtsman. A third patient lives near a hospital where, in a wheel chair, he works as a records clerk.

The fourth patient is still under remedial treatment and prevocational training at the Rehabilitation Centre and it is hoped that his problem will be solved, because he is very strong and agile at walking with calipers and crutches. In this regard it has been the aim of the remedial programme to encourage the paraplegic patient to learn all the daily living activities of ambulation, bathing, toilet, elevation, with the usual domestic facilities without unnecessary gadgets. However, the Rehabilitation Service does construct and supply simple self-help gadgets such as high toilet seats for home use. Neighbours and friends often help the paraplegic home-maker in the construction of ramps and bathroom rails.

Only one female paraplegic patient has been accepted as eligible for rehabilitation in Queensland under the Commonwealth Rehabilitation Scheme. She is a skilled clerical worker whose job is ready for her in a country town. Consequently it has not been necessary to provide special remedial kitchen therapy as for disabled housewives. No doubt the ideal housing conditions would be met by a home built at ground level on flat land near an industrial area.

Amenities and Recreation.

The social and sporting amenities enjoyed by paraplegics are mostly dependent on their contacts and interests before the disability. Despite a long period in hospital, one man still assists a football club with coaching and competes in mat weight-lifting events. He is assisted by his wife, who has similar interests, and both attended the Olympic Games in Melbourne. One man belongs to an archery club.

Other patients with no experience of club membership do not succeed so well, and this field of the rehabilitation follow-up will require development. It is a problem common to many types of patients attending the Rehabilitation Centre and is worthy of community help. Often the disabled make little contribution to such an effort and really require help from those with an experience in group leadership.

Vocational Training and Reestablishment.

The Commonwealth Rehabilitation Service provides vocational training at technical and commercial schools and work therapy at approved industrial workshops for severely disabled rehabilitation trainees who after treatment suffer a residual handicap that may prevent their return to their old occupation. Under this scheme, training fees, books, fares and a living allowance are available to suitable patients who may show a reasonable chance of succeeding in employment. Under work therapy a living allowance is paid until a reasonable skill and output of work are

attained by the trainee; the union representative and the employer are consulted on the duration of the training period and the percentage of work performance.

Of the 13 subjects under review, one returned to his old employment as a draughtsman, and it is hoped that one other, after remedial training, will return to her book-keeping job.

Eight have been trained in book-keeping and clerical work and five have obtained work, and one man has a promise of employment near his home. One of the employed now receives a wage under a slow worker's permit. He was in the late twenties, and after training at the technical school was finally employed in a country town. After a period of departmental work therapy, however, because he was in the adult wage group, his lack of experience was judged a suitable reason for a slow worker's permit at a reduced salary. He has been happy to be employed and hopes to improve his output of work.

One youth with partial paraplegia was forced to accept vocational training and clerical work despite his desire to train as a draughtsman. For a long period he wasted time hoping to be an apprentice, but he eventually accepted the clerical training when it was confirmed that there were no employers willing to apprentice him. This was a fair example of a realistic decision which might have been made at an earlier rate if the boy had been advised by a hospital rehabilitation committee.

Of the 13 subjects accepted for rehabilitation, two men are under active remedial care and their ultimate reestablishment is in doubt. One man, aged 34 years, who was a motor-truck driver, has a rented home for his family in the metropolitan area, but he has no finance for a motor-car and he must complete clerical training or find some special sedentary bench process work. The other is a New Australian who has mastered English. He has no home, but has managed to save a small amount of money.

Discussion.

The objective of the Commonwealth Rehabilitation Service is a remedial and vocational goal. All the hospital patients had recovered their self-sufficiency in such daily living activities as dressing, feeding and self-care, and had received adequate hospital physiotherapy to control contractures and develop good arm and shoulder musculature. The remedial work at the Centre developed a reasonable restoration of function in walking by a long programme of individual and group supervision. In the group work they were mixed and competed with patients with other types of paraplegia or severe weakness of the legs. In games they were matched with all types. This process produced profound psychological improvement, in confidence as well as in speed and endurance. In the late remedial phase the patients learnt more from each other than from the physiotherapy instructors and this was an index of the powers of staff leadership.

A good deal of time was lost in the early remedial phases in brace, caliper and crutch adjustment to suit the changes in weight-bearing due to the increase in activity. This is not an unusual process in the fitting of prostheses for amputees and surgical aids for those with paralysis due to poliomyelitis. However, during this period sessions of educational therapy were included in the remedial programme, when basic English and arithmetic were revised and correspondence courses were supervised by the tutor. Regular hours of study produced good work habits after long periods of inaction in hospital.

The Centre does not have a splint shop and patients were transported at least five miles to the nearest Repatriation splint factory. Only three of the patients employed are using wheel chairs, and the men chiefly use their chairs to go to and from work because no motor-car transport is available.

In view of the vocational goal, only clerical prevocational assessment has been developed at the Centre. The education officer has used the tutor service in basic subjects to check the potential of the rehabilitation trainees for study.

The occupational therapy department has facilities for testing skill and concentration for routine bench work in such work as boot repairing, veneer matching and sheet-metal work. However, it is not possible to be employed in boot repairing unless an apprenticeship has been served, but a man of exceptional talents may succeed as a self-employed jobber.

There are no opportunities for work in an adult sheltered workshop in Queensland. There is no doubt that sheltered employment at piece rates would provide an excellent work incentive.

The question of eligibility for rehabilitation is of interest. Of the 13 selected patients who were considered and accepted for either a remedial or a vocational objective, six are employed; two have jobs in view; one man is delayed in the remedial phase because of urinary infection and one because of bed sores. Two others may not succeed in employment because of lack of transport.

In the future, urinary infection, extensive bed sores and low intelligence quotient may be the chief factors militating against eligibility. It is thought that immobility and lack of housing and transport may be overcome by realistic rehabilitation.

THE BULBOUS NOSE.

By Graham Humby,
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Æsthetically, a bulbous nose tip can be a most offensive thing. It is, of course, due to too large, unequal or too prominent alar cartilages, and the remedy lies in

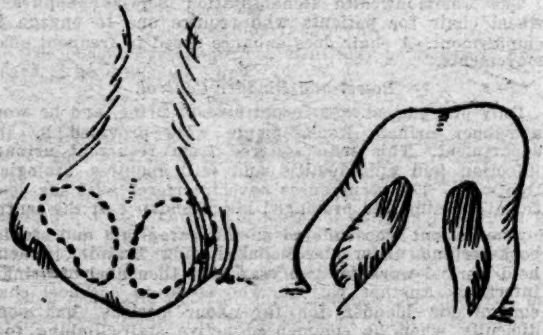

Figure I.

resecting part of these cartilages. Many procedures have been designed for this little problem, but in my hands

Figure II.

Figure III.

none exactly guaranteed the desired result, and so the following operation was worked out to eliminate most of the disappointing results.

The alar cartilages are marked out on the skin of the nose tip with ink (Figure I). The portions to be excised

are decided upon (Figure II). If one is more prominent than the other, more will have to be excised from that side. Incisions are made into the nasal mucosa along the anterior edge of the lateral portions of the cartilages (Figure III). Through these incisions, the lateral parts of the cartilages are freed from both the nasal mucosa and the nasal skin above (Figure IV). The desired

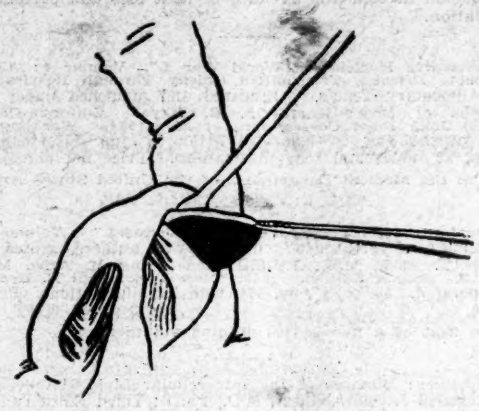

FIGURE IV.

amount of cartilage is then excised. A strip may be left along the lower edge to prevent any subsequent notching of the nostril.

A piece of soft dental metal is moulded around the nose tip to hold it in the desired position for a few days until the post-operative œdema has subsided. No sutures are necessary.

Reviews.

Pathology for the Physician. By William Boyd, M.D., M.R.C.P., F.R.C.P., F.R.S. (Can.), LL.D., D.Sc.; Sixth Edition. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson, Limited. 10" x 6¾", pp. 900, with 149 illustrations and 12 plates in colour. Price: £9 12s. 6d.

THIS book, formerly "Pathology of Internal Diseases", opens with the sentence: "Of all the ailments which may blow out Life's little candle, heart disease is the chief." This must be almost as well known to a generation of medical students as the *"Omnis Gallia in tres partes divisa est"* of an earlier author. But unlike him, Professor Boyd divides his subject into only two parts, medical and surgical, and is still courageously trying to cover the entire field himself. In a younger author such an attempt would nowadays be reckoned rash, and even Professor Boyd, with many successful editions behind him, does not, in this "medical" volume, really achieve his avowed purpose of presenting an account adequate for the needs of graduate physicians preparing for College membership examinations. These men require a great mass of dry and detailed information, such as is found in large books written by a galaxy of specialists, and in the innumerable reviews in the journals. Boyd has always preferred a telling phrase, even a cliché, to an arid exposition; this explains his popularity with students. But times have changed, and although this book has changed with them to a marked degree, it has not changed quite enough to avoid leaving a slightly old-fashioned impression. Indeed, it could not do so and still retain its distinctive character. It remains the dogmatic, sometimes dramatized personal exposition of the subject by a senior, successful and experienced teacher. As before, much stress is laid upon clinico-pathological correlation. Boyd was one of the earliest, and remains one of the most influential, advocates of the need to "winkle" the pathologist out of the deadhouse and make him relate his findings to the clinical story. This has been good for both pathologist and clinician.

However, we read the book with great interest, for Boyd is never dull. All the sections have been brought up to date, and many of them virtually rewritten. Of course, some are more successful than others. In so large a book fault can be found with details, and with matters of emphasis. All the traditional aspects have been covered, and there are new sections on the modern humoral pathology (electrolytes and general diseases) which are not quite so successful. However, the section on neuropathology is especially useful. On the whole, the book is still a good introduction to pathology as it concerns the physician. A list of well-chosen references is appended to each chapter, to guide the more serious student deeper into the subject.

It is most regrettable that the book is extremely carelessly set up. We found some dozens of typographical and other errors, including even a reduplicated picture (Figures 391 and 437). Such haste and carelessness are inexcusable in a book produced by an experienced press and costing nearly £10.

What You Can Do for Angina Pectoris and Coronary Occlusion. By Peter J. Steincrohn, M.D., F.A.C.P.; 1958. Sydney, London, Melbourne, Wellington: Angus and Robertson, Limited. 7¼" x 4¼", pp. 184. Price: 25s.

THIS book has 182 pages and 85 chapters, each with its separate title. It is intended to provide information for those suffering or likely to suffer from coronary artery disease. It is written in a lively conversational style. Pathology, ætiology, diagnosis, prognosis, treatment, management and prevention are all discussed.

The chapter which deals with the desirability of periodical medical consultations is entitled "Yearly or Bi-yearly Physicals?". A quotation from this will give an idea of the style of the writing:

> The important factor is this: do you agree that periodic examinations are necessary? (which you should), then there is time to haggle over the need for a semi-annual rather than a yearly inspection. Up to the age of forty or fifty a yearly check-up is about all that is necessary to give preventive medicine a chance to get in its licks.

The question of smoking is well discussed, and smoking is definitely interdicted.

In the chapter "O! Nurse", the qualifications of the ideal nurse are interestingly discussed. They are enumerated as follows: cheerfulness, optimism, tactfulness, firmness, industry, conscientiousness, tongue control and absence of fussiness.

The little touch about Sir James Mackenzie's doing an 83 at St. Andrews golf course at the age of 65 years, having suffered from angina pectoris since the age of 49, should give encouragement to many patients.

The information given is reliable, and should be of help to patients and potential patients, in addition to their relatives and associates. This book is to be thoroughly recommended. The author has accomplished what he set out to do.

The Individual Psychology of Alfred Adler: A Systematic Presentation in Selections from His Writings. Edited and annotated by Heinz L. Ansbacher, Ph.D., and Rowena R. Ansbacher, Ph.D.; 1958. London: George Allen and Unwin, Limited. 8¼" x 5¼", pp. 514. Price: 30s. (English).

IN this book selections are made from Adler's writings to indicate how his views on normal and abnormal psychology developed. Extracts are also given from other writings that are believed to have influenced Adler's thinking. The authors then comment on both these aspects, and they are careful to indicate what are their views and what are the views of Adler or other contributors.

This volume is easily read, and presents in a clear manner Adler's theories on the masculine protest, the significance of inferiority feelings motivating behaviour, and the basis of neurotic disorder.

Laboratory Medicine: Hematology. By John B. Miale, M.D.; 1958. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical) Limited. 10" x 6¾", pp. 735, with 192 illustrations and nine plates, including five in colour. Price: £7 11s. 3d.

THIS textbook of hematology is one of a triad on laboratory medicine. There are 735 pages, and the high standard of production is in accord with that usually found in books from the C. V. Mosby Company. The first two chapters are devoted to discussion of hæmopoiesis and of cellular morphology of peripheral blood and marrow. The complete morphological descriptions are accompanied by coloured plates of high quality. The second chapter includes brief sections on supravital examination, phase con-

trast microscopy, electron microscopy and cytochemistry. In the chapter on bone marrow there is a very useful series of 36 case reports. These are well illustrated with black and white microphotographs of peripheral blood and marrow. Chapters on peripheral blood, the erythrocyte and blood transfusion follow. Disorders of erythropoiesis and leucopoiesis are discussed along customary lines. The final chapter, on "Hemostasis and Blood Coagulation", is a good review of modern knowledge on this subject and its disorders. An appendix of technical methods is satisfactorily complete.

In some respects, it may be thought that too much space is devoted to detail and illustrations. However, a list of 62 chemical agents which may provoke leucopenia is an example of the many useful facts which are available in this book.

Somewhat different in form from the old-established textbooks on hæmatology, this book is worthy of a place alongside them.

Notes on Books.

The Penguin Song Book. By Leslie Woodgate; 1958. Mitcham: Penguin Books, Limited. 7½" × 5", pp. 192. Price: 7s.

THIS is the third reprinting of a charming song-book containing what Leslie Woodgate describes as a personal assortment—114 songs he has loved from childhood. Most people who like to sing will appreciate his choice, which is interestingly varied; it includes traditional airs of several countries, drinking songs beloved of students, one or two Christmas carols, some music-hall ditties, a marching song or two—in fact, a little of almost everything except modern jazz. Woodgate has written "a simple but independent piano accompaniment", and states that he has reasoned that "there is no need to play the same notes as the singer because the tune should be able to take care of itself". Not everyone will agree with this attitude, unless the songs are being sung by trained musicians; our impression is that many of the accompaniments wander so far away from the melody that the songs have been made more suitable for solo work than for group singing by people who love to sing. Another grave disadvantage is the format of the little book, which makes it tend to fall off the piano, and at best give the accompanist eyestrain trying to see notes hidden behind curves in the pages. However, four very good features are the inclusion of standard musical directions, an excellent index, descriptive and historical notes concerning every song and the provision of some blank pages for additions. We are grateful to Mr. Woodgate for producing a book in which we can quickly find many of the well-loved old songs that may otherwise be difficult to trace.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Insulin Crystals: Chemical and Biological Studies on Insulin Crystals and Insulin Zinc Suspensions", by Jørgen Schlichtkrull; 1958. Copenhagen: Einar Munksgaard Publishers. 9¼" × 6¼", pp. 142, with 39 illustrations. Price not stated.

A record of investigations carried out during the years 1950-1957 in Denmark.

"A Handbook of Medical Hypnosis: An Introduction for Practitioners and Students", by Gordon Ambrose, L.M.S.S.A., and George Newbold, M.B., B.S., M.R.C.S., M.N.S.A., D.R.C.O.G., D.C.H.; Second Edition; 1958. London: Baillière, Tindall and Cox. 8¼" × 5", pp. 289. Price: 27s. 6d. (English).

The book has been revised and added to since the first edition was published in 1956.

"Leukemia", by William Dameshek, M.D., and Frederick Gunz, M.D., Ph.D.; 1958. New York and London: Grune and Stratton, Incorporated. 10" × 6¾", pp. 436, with 142 illustrations. Price: $16.75.

The authors have aimed to present "a fairly comprehensive picture of the present state of our knowledge (some might say 'ignorance') of leukemia".

"Cold Injury", edited by M. Irené Ferrer, M.D.; 1958. New York: The Josiah Macy, Jr. Foundation. 9" × 5¾", pp. 344, with 19 tables and 69 figures. Price: $5.95.

Transactions of the Fifth Conference held under the auspices of The Josiah Macy, Jr. Foundation, in March, 1957. Subjects include animal and human adaptation to cold, hibernation, observations on ventricular fibrillation in acute hypothermia, the use of glycine in hypothermia, energy metabolism in cold and avenues of heat loss and peripheral circulation.

"Preventive Medicine in World War 2." Volume 4: "Communicable Diseases Transmitted Chiefly Through Respiratory and Alimentary Tracts." Prepared and published under the direction of Major-General S. B. Hays. Editor-in-Chief: Colonel John Boyd Coates, jnr., *et al.* 1958. Washington: Office of the Surgeon-General. 10" × 6¼", pp. 568, with 48 charts, 91 tables and four illustrations. Price not stated.

From the Medical Department of the United States Army.

"Treatment of Cancer and Allied Diseases." Volume I: "Principles of Treatment", by fifty-five authors, edited by George T. Pack, M.D., F.A.C.S., and Irving M. Ariel, M.D., F.A.C.S. Second Edition. 1958. New York: Paul B. Hoeber, Incorporated. 10" × 6¾", pp. 664, with 505 illustrations. Price: $22.50.

The first of a new series of nine volumes.

"Lipidoses: Diseases of the Intracellular Lipid Metabolism", by Siegfried J. Thannhauser, M.D., Ph.D.; Third Edition; 1958. New York and London: Grune and Stratton, Incorporated. 9¼" × 6¼", pp. 616, with 126 illustrations and 50 tables. Price: $19.75.

Extensively revised since the previous edition appeared in 1950.

"An Atlas of Surgery", by F. Wilson Harlow, M.B., B.S. (Durham), F.R.C.S. (England), with a foreword by Sir Cecil Wakeley, Bt., K.B.E., C.B., LL.D., D.Sc., F.R.C.S.; 1958. London: William Heinemann (Medical Books), Limited. 13¾" × 8¾", pp. 380, with 1292 illustrations. Price: 50s. (English).

A pictorial *aide-memoire* of common and important surgical facts and procedures.

"Glasgow's X-Ray Campaign Against Tuberculosis: 11th March-12th April, 1957." Glasgow: Glasgow Corporation Printing and Stationery Department. 10" × 7½", pp. 118, with many illustrations. Price not stated.

A report of the conduct and results of an anti-tuberculosis campaign.

"The A B O Blood Groups: Comprehensive Tables and Maps of World Distribution", by A. E. Mourant, M.A., D.Phil., D.M. (Oxford), M.R.C.P. (London), Ada C. Copec, D.ès Sc. (Genève), and Kazimiera Domaniewska-Sobczak, M.A. (Wilno), A.L.A.; 1958. Oxford: Blackwell Scientific Publications. 9¼" × 7½", pp. 284, with illustrations. Price: 42s. (English).

The authors have aimed to bring together all data published to the end of 1957 on the frequency of the A B O blood groups in human populations.

"Lecture Notes on Midwifery", by T. F. Redman, T.D., M.B., Ch.B., F.R.C.S. (Edin.), M.R.C.O.G.; 1958. Bristol: John Wright and Sons, Limited. 7½" × 4½", pp. 220. Price: 12s. 6d. (English).

Notes from a course of lectures to midwives.

"A Symposium on the Evaluation of Drug Toxicity." Editors for Imperial Chemical Industries, Limited: A. L. Walpole, Ph.D., B.Sc., and A. Spinks, M.A., Ph.D., B.Sc.; 1958. London: J. and A. Churchill, Limited. 9¼" × 5¾", pp. 153, with 58 illustrations. Price: 25s. (English).

The record of a symposium held at the opening of the new research laboratories of Imperial Chemical Industries Ltd. (Pharmaceutical Division) in October, 1957.

"The Preservation of Eyesight", prepared with the advice of a consultative committee and edited by Sir Arthur Salisbury MacNalty, K.C.B., M.A., M.D. (Oxon.), F.R.C.P. (Lond.), F.R.C.S. (Eng.), D.P.H., Hon. F.R.S. (Edin.); 1959. Bristol: John Wright and Sons, Limited. 8¼" × 5¼", pp. 115, with nine illustrations. Price: 12s. 6d. (English).

A book for the non-medical reader.

The Medical Journal of Australia

SATURDAY, APRIL 4, 1959.

THE FULBRIGHT ACT AND AUSTRALIA.

THE term "Fulbright Scholarship" has in recent years come into almost universal usage, but by no means all who use it have a clear idea of its origin or connotation. Consequently attention may be drawn to "Fulbright Programme in Australia; The First Eight Years and the Future", a brochure issued in 1958 by the United States Educational Foundation in Australia. The history of the Fulbright Programme is set out briefly in the section entitled "Swords into Ploughshares", a title which describes the position exactly. The story, briefly, runs as follows. In 1946 the *Fulbright Act* in the United States amended the *Surplus Property Act* of 1944, so that some of the currencies and credits of other nations acquired by the U.S.A. through the sale of surplus property then abroad might be used for educational exchanges. The sponsor of the Act, and the moving spirit in all the activity that it brought about, was Senator James William Fulbright, of Arkansas, who had spent a period at Oxford as a Rhodes Scholar, and as a result was vitally interested in the role that exchanges of students between countries could play in the promotion of international peace and understanding. We are told that inspiration for the programme stemmed from the fact that when fighting in the second World War came to an end in 1945, the wartime supply programme of the United States was at its peak. Many million dollars' worth of military equipment and supplies were at the fighting fronts, or else in storage throughout the world. Almost instantly, these supplies ceased to be needed for purposes of war, and some of them became a drain on the U.S.A. because of maintenance and storage payments. However, the material was of potentially great value to countries suffering from the effects of war damage and from shortages. The *Fulbright Act* provided that when this surplus property was sold abroad, "some of the foreign currencies and credits so acquired by the U.S. should be devoted to the costs of formal education of American citizens in other countries, and to the transportation to the U.S. of students from abroad 'who desire to attend American schools and institutions of higher learning'". The Act stipulated that an agreement with a foreign government should not authorize an aggregate expenditure of an amount of the foreign currency exceeding $20,000,000 in value, or more than $1,000,000 in any one year. The President of the United States was empowered to appoint a Board of Foreign Scholarships with 10 members, to select the students and educational institutions qualified to participate in the programme. To the Board was given the responsibility of supervising the exchange programme; this task has been successfully carried out in cooperation with the U.S. Department of State, and with many private organizations and institutions. A conspicuous feature has been the help of families and individuals in the U.S.A. who have generously made scholarship holders "at home" in that country.

The Fulbright programme has been described as "the most fabulous investment ever authorized by the Congress of the United States". Its objectives are as follows:

To build up a greater and more accurate store of knowledge and information about the United States in other countries, so that respect for and confidence in the aims and policies of that nation will be increased;

To contribute to a better understanding in the United States of the way of life, the culture, and the aspirations of other people; and

To promote greater stability in international relationships by broadening community of interests between the people of the United States and other free peoples, and by increasing awareness of the common principles underlying a free and orderly society.

The present account covers only the first eight years of the programme's operation; but its achievement, in terms of the stated purposes, is incalculable. Indeed, as the author of "Swords into Ploughshares" writes, "its value has not been in dollars or pounds, but in the promotion of understanding and the growth of knowledge". An incidental result of the influx of foreign students has been the growth in the U.S.A. of a deeper understanding of the ways of life, problems and values of peoples of other countries, and of their cultural and educational backgrounds. Moreover, many American citizens have received grants covering transportation and other expenses to enable them to study, teach and undertake research abroad; they have gained a wider knowledge of world affairs, and have formed firm friendships.

How has the Fulbright Programme affected Australia? First and foremost, it has helped to overcome the greatest obstacle to post-graduate study in the United States of America, the cost of transportation. The Fulbright Agreement was signed with Australia in November, 1949, and has been enthusiastically supported by government departments, universities and colleges, and private organizations dedicated to the cause of international understanding. A provision is made that the attendance of Australians at American institutions must not displace American citizens. The Act provides only for the use of credits and currencies resulting from the sale of surplus war materials; therefore no dollar funds are available for grantees from that source. However, help is often available in the form of scholarships or bursaries open to foreign students in American universities, although these have no connexion with the Fulbright Programme. From the beginning of the Fulbright Programme until the end of 1955, 340 Australians went to the U.S.A. and 300 Americans came to Australian institutions for post-graduate study, teaching or research. Australian graduates have been welcomed in many American institutions, and have received payment on the usual university scale for their term of Fulbright study. In the period under review, nearly 25,000 people from the U.S.A. and 28 other countries held Fulbright grants.

The greater part of the publication is taken up with tributes to the programme written by people from Australia who have held Fulbright grants. A number of members of the medical profession are among them, as well as many from the ancillary sciences. Their comments are written from varying points of view; but all are unanimous in stressing the value of the contacts they have made from both the academic and the personal points of view. Many emphasize the dissipation of misconceptions about Americans and their ways of life that are commonly held. Perhaps the neatest summary is that emanating from the pen of Mr. D. G. Sadler, a teacher:

*F*raternal contacts with students and thinkers from other lands.

*U*seful knowledge and understanding of the aspirations and dedications of several countries.

*L*asting friendships formed with men and women of differing races, religions and cultures.

*B*eneficial experiences and progressive ideas in my chosen life-work—Education.

*R*espect for the worth and integrity of the individual.

*I*nsights into agencies sincerely striving to achieve harmonious relations between nations.

*G*reater ability to express the motives of peace-loving people through any medium of communication.

*H*umble but determined resolve to propagate the ideals for which the Fulbright programme stands.

*T*angible evidence of contributions made to world progress by cultures other than my own.

The success of the programme has undoubtedly been due to the careful choice of participants, for which credit must be given to the Boards of Directors that have succeeded each other from the inception of the scheme. Many outstanding people have figured on the Australian Boards. Grants are awarded to persons who, because of their background and experience in their own countries, and through their work and contacts abroad, are considered likely to be able to make a positive contribution to international understanding. A guiding principle is that "grantees must possess the abilities and personal characteristics which will enable them to develop a true understanding of their American hosts, and upon their return to this country to communicate an honest expression of their experiences to their fellow Australians". (The conditions governing applications for Fulbright Scholarships were set out in this Journal in the issue of November 1, 1958, at page 617.)

All over the world, evidences of the United States' care for others are to be found, and it is not surprising that the idea of the Fulbright Programme with its incalculable results should have arisen in the mind of a citizen of that country. It has opened the way to wider experience for thousands of workers in all worthwhile walks of life. Happily, the traffic is two-way.

Current Comment.

PLASTER OF PARIS.

It is a little over 100 years since plaster of Paris bandages were first used, and the method of preparing them changed little till about 20 years ago. At the beginning of the last war, in many hospitals the preparation of plaster bandages by hand, done by rubbing powdered plaster of Paris into coarse bandages, was still one of the chores which occupied the slack moments of probationer nurses. Nowadays, when plaster of Paris bandages come neatly packed from the factory, much more control over their exact properties is possible by the addition of catalysts and other substances. Two Canadian authors, E. H. Simmons and L. A. Cox,[1] have published a study, using three different types of plaster bandage, to examine the techniques used by orthopædic surgeons and to find out the properties desired by these surgeons in a plaster of Paris bandage. Their data were collected from 12 different Canadian hospitals and involved 35 orthopædic surgeons. The bandages used differed in such properties as setting time, plaster loss, and the "feel" of the wet bandage during application. One bandage with a low binder content had a very smooth, creamy plaster mass, but lost up to 35% of its plaster content when squeezed. Another with a higher binder content was not so creamy in texture, but retained more of its plaster and was therefore potentially stronger. The third bandage was similar to the second except that it had a setting time of five to eight minutes instead of two to five minutes.

It was found that most surgeons preferred the extra fast setting bandages for most purposes, but the medium fast setting bandages were often considered better for larger plasters. Simmons and Cox conclude that there is a need for both types of bandage. They also found that the surgeons attached much importance to the "feel" of the plaster during application, and considered that a smooth, creamy feel was important for good moulding, for proper fusion of cast layers, to prevent ridging and to aid in the over-all ease of application. However, Simmons and Cox suggest that the surgeons perhaps place too much emphasis on the "feel" of the bandages and not enough on ultimate cast strength and its rate of attainment.

On the experimental side of the investigation Simmons and Cox demonstrated various facts about the setting of plaster, some of which are part of the traditional knowledge of casualty departments; but as such traditional knowledge is often inaccurate, it is well to restate the facts. Increasing the temperature of the water reduces the setting time; with one type of bandage an increase in the temperature of the water from 25° C. to 45° C. decreased the setting time from 11·5 minutes to nine minutes. An excessive amount of water in the completed plaster not only delays the setting of the plaster, but decreases its strength. For this reason squeezed bandages set faster than unsqueezed bandages; in bandages with a low plaster loss, squeezing results in faster attainment of cast strength and higher ultimate cast strength. This is interesting in view of the fact that most Canadian surgeons did not squeeze their bandages. Another corollary of the effect of excess water on setting time and strength is that humid conditions during drying have an adverse effect on the ultimate strength of a cast, and some surgeons noted that casts applied on hot humid days tended to be unsatisfactory. Slower setting bandages appeared to be stronger than fast setting ones. It is well known that disturbance of a cast during setting interferes with its ultimate strength. The strength of a cast increases rapidly during the first few hours after it is applied, but an appreciable increase in strength continues for about 48 hours, by which time the strength of the cast is approaching its ultimate value, though this is not reached for about seven days. Simmons and Cox have performed a useful service in providing a basis of carefully ascertained fact about the properties of the familiar plaster bandage.

DOG IN A SPUTNIK.

We have been interested to read a paper by A. G. Kousnetzov[2] on the Russian experiments which culminated in the now famous journey into space by the dog Laika, in the second artificial satellite launched by the Russians eighteen months ago. The paper is a

[1] *Canad. med. Ass. J.*, 1957, 76: 941 (June 1).
[2] *J. Aviat. Med.*, 1958, 29: 781 (November).

verbatim transcript of one read at the Third European Congress of Aviation Medicine in September, 1958, and the account it gives is brief and superficial. Nevertheless, some interesting facts emerge. Russian scientists have been conducting experiments into the effects of space flight upon living organisms for nearly a decade. Initially, animals in hermetically sealed cabins were sent by rocket to heights between 100 and 210 kilometres, and the cabins returned to earth by parachute. Instruments were included to record changes in the animals' breathing, blood pressure and temperature, and other data, and no considerable changes were noted as the result of the initial acceleration, the gravity-free interlude at the summit of the trajectory, or the deceleration when the parachute returned to the Earth's atmosphere. The animals seemed none the worse for their experiences, and some survived two such journeys. The stage was now set for Laika's satellite voyage, a voyage which was the only means by which the effects of zero gravity and of primary cosmic radiation could be studied under the conditions of space flight. Transmitters relayed information about Laika's pulse and respiration rate, and even an electrocardiographic tracing. The critical moments of the flight were the launching and the putting into orbit. Good recordings were received of the events at the moment of putting into orbit. The pulse rate increased to three times and the respiration rate to between three and four times the initial rate, but the electrocardiogram showed no serious changes. In Kousnetzov's words, "There is every reason to believe that the changes noticed in the physiological functions of the animal were brought about by the sudden effect upon the latter of external irritants: acceleration, noise and vibration". However, the pulse and respiration rates took three times as long to return to normal as in corresponding laboratory tests. This was interpreted as being due to the fact that, whereas in the laboratory tests, once acceleration ceased, the animal found itself under normal conditions, in the sputnik acceleration was followed by a complete absence of gravity. Again to quote Kousnetzov, "The absence of signals from the receptive organs as to the position of the body in space caused a change in the functional state of the nervous system which regulates the blood circulation and breathing . . . . ". It seems fair to interpret these statements as meaning that the dog was utterly terrified by the sudden acceleration, accompanied by a tremendous outburst of noise and vibration, which accompanied the "going into orbit", and that when the acceleration and noise had died away the strange experience of weightlessness prevented a quick return of confidence. However, the animal did not appear to have suffered any physical harm, and apparently survived in a normal physiological state until the supply of oxygen failed. It was not possible to draw any conclusions as to the effects of cosmic radiation.

Since this experiment, Kousnetzov states, animals have been launched into space at a height of 473 kilometers (294 miles), and have been returned to the earth's surface from this height in good health. It is of course well known that the Americans have also been conducting experiments in sending animals to great heights by rocket, and have apparently accumulated sufficient information about the necessary safeguards and techniques to plan a "flight into space" by a human volunteer in the not very distant future. Such trips are likely to remain hazardous, but it does seem that the launching of a manned satellite is much nearer to achievement than most of us would have thought possible a few years ago.

PSYCHIATRY IN THE BRITISH ARMY IN THE SECOND WORLD WAR.

An account of the problems of the British Army Psychiatric Services during World War II would appear at first glance to be stale fare in 1958. However, the psychiatrist who is interested in the development of psychiatry as a discipline in either civilian or military medicine should possess Robert H. Ahrenfeldt's recently published book on psychiatry in the British Army in the Second World War.[1] Ahrenfeldt was Deputy Assistant Director of Army Psychiatry, Army Medical Directorate of the War Office. In this office he presumably had several advantages. He was in close contact with Dr. J. R. Rees, consulting Psychiatrist to the Army, he had intimate access to many official and unofficial documents relating to psychiatry in the Services, and he obviously had opportunities for seeing psychiatry in the field as well as from a chair in the Medical Directorate. In his book he first presents a carefully documented account of the growth and functions of the Psychiatric Service from a small group of men to a force of over three hundred psychiatrists. The strongest resistance to the growth of this service came from both uninformed lay heads of political and military departments and army medical officers of senior standing. There were notable exceptions of course, of whom Lieutenant-General Sir Ronald F. Adam and Lieutenant-General Sir Alexander Hood are cited. Ahrenfeldt found, however, that psychiatry in the armed services was greatly appreciated by those men who saw the problem at close quarters—namely, commanders, medical officers and non-commissioned officers in the field.

This book is an object lesson in patience, industry and the unemotional martialling of facts when a new idea is being presented to an emotionally biased unbeliever. When the official critics of psychiatric intervention were more than usually frustrating, they were answered by experimental studies, statistics and further facts. Ahrenfeldt examines the problem of "Personal Selection", "Officer Selection" and the handling of mental defectives as a military problem. He submits the case for the use of a well integrated team of psychiatrists and psychologists. Ample evidence is offered that, with all its admitted defects, this approach is more reliable than the subjective judgement of either an untrained layman or a doctor who considers he can determine the qualities of intellect and personality by looking at a man.

Ahrenfeldt tells the sorry tale of the elimination of psychologists and psychiatrists from the "War Office Selection Board for Officers", even after it had proved conclusively their effectiveness in a selection procedure. He describes the incredible mishandling of mental defectives in the Army, despite good scientific advice, at a time when Britain was hard-pressed to utilize its manpower efficiently. He discusses and defines the difficult role of the psychiatric service in disciplinary problems and its relation to the problems of proper selection and management.

It has always been difficult to know how to effect discharge of men with character disorders from the armed services—when to use medical and when to use non-medical avenues. Ahrenfeldt shows how this problem was met in his experience. The section on forward psychiatry is less likely to be of value to the psychiatrist seeking a guide for organization in the event of any future war. However, emphasis is laid on the pre-eminent importance of pressing psychiatrists as far forward as possible. Ahrenfeldt finally describes the experiences of Army Psychiatry in the problems of rehabilitation. There are no clear answers to the problems of war psychiatry to be found in this book; and there is little that is clinical. Despite this, it is a book which every doctor and psychologist interested in service psychiatry should have. It would be highly desirable too that a copy should rest on the tables of all senior non-medical administrative officers, because a future conflict will not give them time to re-enact by the process of "guesswork" and "untrained common sense" the administrative faults of their predecessors in the fields of medical and non-medical administration.

[1] "Psychiatry in the British Army in the Second World War", by Robert H. Ahrenfeldt, with a foreword by J. R. Rees; 1958. London: Routledge and Kegan Paul. 8½" × 5", pp. 328. Price: 35s. (English).

Abstracts from Medical Literature.

ORTHOPÆDIC SURGERY.

Tuberculosis of the Femoral Neck and the Great Trochanter.

R. T. Ahern (*J. Bone Jt Surg.*, August, 1958) reviews six cases of bone tuberculosis in which the focus was a juxta-epiphyseal lesion in the region of the femoral neck. Three of these six patients were treated conservatively. Three were treated by surgical excision of the focus under antibiotic cover. The antibiotics used were streptomycin with P.A.S. or isoniazid or both. A subtrochanteric approach was used. Two of the three patients treated conservatively made a complete recovery, but healing was very slow; all three of the patients treated by surgery and chemotherapy made a rapid and complete recovery. The author points out that 0·5% of all skeletal tuberculosis originates in the femoral neck, although many authorities consider that all tuberculous disease of the hip begins in the femoral neck or in that area. There is no doubt that in the past any lesion beginning in the femoral neck went on to form a pan-arthritis. The author also reviews the histories of 32 patients suffering from tuberculosis of the gluteal bursa with involvement of the great trochanter, which is a relatively common lesion. These patients were treated by debridement, antibiotics applied topically and given systemically, and immediate closure. The author advises against total excision of the trochanter as a dangerous procedure and states that the results of the treatment described were very good.

Flexor-Extensor Transplant for Claw Toes.

J. B. Pyper (*J. Bone Jt Surg.*, August, 1958) considers that claw toes is a condition which might be expected to result from paralysis of the intrinsic muscles, but this has not been proved. It does appear that the action of the interossei and the lumbricales is reduced in efficiency in this condition. The two operations which are used to treat it are: (i) the Lambrinudi operation, which acts by increasing the leverage of the flexor tendons after the interphalangeal joints of the toes have been fused; this is not a simple toe-straightening operation as is often thought; (ii) the Girdlestone operation, which was developed as being less destructive and which avoids the fixation of normal joints; it has been used where the toes are flexible; the extensor tendons are divided, and the flexor is transplanted to act as a reinforcement to the intrinsic muscles. The author has followed up 23 patients who had received treatment for clawed toes by a Girdlestone flexor-extensor transplant during the last ten years. Several had had both feet operated on, and there were 40 feet to be considered. These patients were mostly in their late teens. The results were not considered to be universally successful. It was found that if callosities and metatarsal pain were present before operation they were not relieved. Often the divided extensor tendons regenerated and the condition reverted to the pre-operative state. The interphalangeal joints often became stiff. In effect the operation became a Lambrinudi. This occurred in some of the successful cases; in these the shape of the toes improved and the corns on the tops of the interphalangeal joints disappeared, and the patients walked better. The author therefore considers that this plastic repair was in general not as successful as the more commonly performed Lambrinudi operation.

The Iliac Apophysis and the Evolution of Scoliosis.

A. Zoussis and J. I. P. James (*J. Bone Jt Surg.*, August, 1958) studied 800 patients with scoliosis at the Royal National Orthopædic Hospital over the last ten years. They quote a statement by Risser that "the completion of ossification excursion of the iliac apophysis has been proven to occur simultaneously with the completion of vertebral growth" and state that 224 of their cases were relevant to this proposition. They state that in the management of scoliosis, in deciding for or against operative intervention the knowledge that no further deformity can occur is of the greatest practical importance. In studying this series the maximum and average amounts of increase of the curvature were observed during periods of development of the apophyses. The evolution of the vertebral apophyses was related to the development of the curvatures. Also the menarche was related to the evolution of the curvature. Finally it was confirmed that after completion of the growth of the iliac apophyses spinal growth and curve progression ceased. This also applied to paralytic curves. It was noted that the menarche and the cessation of growth of the apophyses of the vertebral bodies occurred in advance of the cessation of growth of the iliac apophyses. It was also noted that the growth of the iliac apophyses was unaffected by poliomyelitis.

Gout.

J. Talbott (*J. Bone Jt Surg.*, October, 1958) discusses selected aspects of acute and chronic gouty arthritis of particular interest to the orthopædic surgeon. He states that a presumptive diagnosis of acute gout should be entertained in any unexplained acute inflammation of one or more joints, particularly in an adult male. A family history of gout, renal lithiasis, or other ancillary features may be noted. The clinical description of the acute attack is most important in diagnosis. Confirmation of the diagnosis rests upon a prompt response to a full course of colchicine. The serum level of uric acid is not a reliable diagnostic aid. Radiographic evidence in the earlier years of the disease is confined to the appearance of soft tissue swellings at the time of the acute attack. The pathogenesis of the acute attack is not known, but the underlying metabolic disturbance is associated with an increased formation of uric acid by the body. Contemporary research has not supported the view that diminished destruction and impaired excretion of uric acid are a cause of gout. The author states that the prognosis in gout is excellent if the correct prophylactic regimen is followed. This involves the use of colchicine and a uricosuric agent (probenecid) administered daily for moderately or severely afflicted patients, and less often for those mildly affected.

The Influence of Cortisone on Bone.

E. Story (*J. Bone Jt Surg.*, August, 1958) reports the results of a study of the effect of mechanical stress on bone. The stress was applied by a hellical torsion spring acting on incisor teeth of rabbits. The changes occurring on the pressure and the tension sides of the teeth were examined histologically. It was found that there was absorption of bone on the side to which the tooth was moving, the pressure side, and bone formation on the opposite or tension side. When cortisone was administered to the rabbit during this experiment it was found that there was an increase in the amount of absorption, particularly in the early stages, and later an inhibition of the formation of new bone on the tension side. This supports other experimental evidence that cortisone leads to porosis in man either during its therapeutic administration or in Cushing's syndrome.

Hereditary Familial Essential Osteolysis.

S. Thieffry and J. Sorrel-Dejerine (*Presse méd.*, November 26, 1958) describe a special type of hereditary familial essential osteolysis; their subjects were five members of the same family in three successive generations, without known consanguinity. The condition began in infancy, and was characterized by spontaneous osteolysis of the carpal and tarsal bones, the ossification of these bones having been previously apparently normal. The process ceased spontaneously in childhood, leaving serious residual deformities of the hands and feet, but without having affected the rest of the skeleton except the bones immediately in contact with those damaged; these were only slightly affected. Morphological anomalies of the cranio-facial bones accompany the condition.

PHYSICAL MEDICINE.

Bone Growth after Poliomyelitis.

F. J. Kottke *et alii* (*Arch. phys. Med.*, December, 1958) have studied the rate of longitudinal bone growth in the lower extremities in 17 children, who had paresis of one leg and nearly normal strength in the other leg after acute anterior poliomyelitis. Over a period of one to seven years, repeated orthoröntgenograms were taken, and from them bone lengths were measured. The effect on longitudinal bone growth of the long-term administration of a sympatholytic drug, a dihydrogenated ergot alkaloid compound, was studied in 14 children. It was found that growth of the tibia of the paretic leg after poliomyelitis occurred only 80% as rapidly as growth in the normal leg. Femoral length increased at over 90% of normal rate, and total

extremity length at 83% of normal rate. Treatment with the sympatholytic drug increased tibial growth in the paretic leg to 104% of normal, femoral growth to 95%, and total extremity length to 100%. The authors state that this study is further support for the hypothesis that, after poliomyelitis, there is reflex hyperactivity of the sympathetic nervous system in response to cold, which results in vasoconstriction in the extremity and inhibits epiphyseal bone growth.

Plantar Warts Treated with Ultrasound.

H. KENT (*Arch. phys. Med.*, January, 1959) states that plantar warts respond to ultrasonic therapy, particularly when they are single and if they are treated early. In a series of nine cases, the results suggested that ultrasound was effective in a large majority of such warts. The patients who had previously received X-ray and podophyllin therapy showed delayed responses to ultrasound. The author states that pain is relieved almost immediately by ultrasound, and necrosis of the wart follows. Normal skin is unharmed by the technique, which is described. Changes evoked in the warts suggest a vascular, a molecular or a viral effect.

Surgical Metal Implants and the Ultrasonic Field.

J. F. LEHMANN *et alii* (*Arch. phys. Med.*, December, 1958) state that surgical metal implants are commonly used in the treatment of fractures and joint diseases, which are frequently accompanied by the development of difficult contractures. The use of deep heating procedures such as ultrasound would be very helpful in such conditions. They have therefore investigated the acoustic properties of metals used for surgical implants. They have found that a large amount of ultrasonic energy is reflected at the tissue-metal implant surface. This leads to the establishment of patterns of standing waves in front of the implants, and to focusing. The increase of intensity in the focal area has been measured and found to be appreciable. The authors state that whether or not this, in turn, will lead to a selective rise of temperature in tissues depends on other factors, such as the dissipation of heat through conduction and convection, the specific heat of the metallic implants and of the surrounding tissues, and the amount of ultrasonic energy absorbed by the overlying tissues. Therefore, further investigations seem to be necessary, to determine whether or not the increase in intensity produced by the presence of the surgical metal implants could lead to overheating of certain areas in the tissues.

Multiple Sclerosis: Rehabilitation of a Patient.

S. OLEJNICZAK AND W. W. GLAS (*Arch. phys. Med.*, January, 1959) report the rehabilitation of a patient suffering from multiple sclerosis. He had paralysis and flexion contractures of both lower extremities, loss of sensation below the tenth dorsal segment, sacral and gluteal decubitus ulcers, and loss of bladder and bowel control; he was bedfast. Associated features were severe apathy, depression and malnutrition. Both hips were disarticulated, the decubitus ulcers were closed and a cystostomy was established, after which intensive physical therapy and occupational therapy were instituted. He was taught handcrafts, with emphasis on strengthening the grip of his hands. He was satisfactorily rehabilitated and able to return home. Follow-up visits show that the patient and the family are well adjusted to the disability, and the patient continues to do well on the home programme that was initiated at the hospital. He can partly support himself by working at a trade which he learned in occupational therapy.

Management of Trochanteric Bursitis.

R. M. KROUT AND T. P. ANDERSON (*Arch. phys. Med.*, January, 1959) have continued their investigation of the treatment of chronic or subacute trochanteric bursitis of the hip, and present a review of the total management of 50 patients. The condition was diagnosed in accordance with criteria set out in the same journal in October, 1958. The forms of treatment employed were correction of any associated disorder, bed rest, controlled limitation of activities, short-wave diathermy, X-ray therapy, local injection, nerve blocks and appropriate home treatment. All but four of the patients were treated with a combination of two or more of these forms of treatment. The mean duration of trochanteric bursitis after initiation of treatment was 12 weeks; patients with associated disorders required a longer time than those without. Of the 50 patients, 45 were improved, 31 achieving complete relief of signs and symptoms. In the 36 cases in which the bursitis was secondary to or associated with some other condition, there was a definite correlation between relief of the bursitis and the correction of the associated disorder. When the associated disorder was not treated or was unsuccessfully treated, the bursitis persisted.

Medico-Legal Aspects of Physical Medicine and Rehabilitation.

H. WING AND A. L. WATKINS (*Arch. phys. Med.*, December, 1958) discuss the ever-growing interrelationships between law and the speciality of physical medicine and rehabilitation. The first section of their paper deals with applicable features of medical jurisprudence. They then discuss the liability and responsibilities of physicians and other personnel of the departments within hospitals, as well as the legal implications of procedures and equipment employed, and the insurance aspects of the matter—medical reports, cooperation with statutory and administrative bodies such as workmen's compensation boards, rehabilitation commissions, etc., and the evaluation of physical disability for purposes of litigation, settlements, or testifying in courts. The authors conclude that successful rehabilitation depends on an understanding and integration of these aspects by responsible physicians.

Training and Fitness.

K. HARPUDER (*Arch. phys. Med.*, December, 1958), in the eighth John Stanley Coulter Memorial Lecture, discusses training and fitness from the point of view of rehabilitation. He states that fitness for the handicapped and the aged can be defined in the same terms as for the average man, with certain added limitations. Beyond clinical impressions, no data are available on how chronic arthritis, peripheral vascular disease or chronic neurological disease interferes with physical performance, or on what training and mechanical aids and adjustments will do to increase physical ability and total functional fitness. The purpose of training for the aged and handicapped is to increase their functional fitness, and their ability to handle activities of daily living and the management of a suitable occupation. In this instance, training is not a purpose unto itself. It should be designed to prepare for these activities on an individual basis, take maximum advantage of experience and skill, and give due consideration to psychological factors. Thorough investigation is needed of the metabolic, respiratory and circulatory effects of exercise, and of the methods, limits and goals of training. Finally, a detailed study should be made of the physiological effects of specific daily, recreational and occupational activities in specific disabilities.

Vocational Rehabilitation.

J. L. RUDD AND S. N. FEINGOLD (*Arch. phys. Med.*, January, 1959) describe a particular type of workshop or work-adjustment centre now being established in various parts of the United States of America. They state that workshops, as part of the community counselling and placement agency, have shown a new and steady growth in the vocational guidance field. It is in this area that some of the best results in vocational rehabilitation have been achieved within the last decade. This type of workshop is most useful when the pattern of the subject's individual work behaviour cannot be assessed through other techniques, or when special aspects of vocational activities must be developed or observed. Executives concerned with the employment of personnel have been greatly impressed by the productivity and creativity of the handicapped. The authors state that activities at the centre have the following results: (i) A form of "dynamic rehabilitation" affecting the aging and the mentally or physically handicapped, a fair proportion of whom were placed in competitive employment. (ii) Work evaluation, through observation of the changing of attitudes and the earning of skills. This indicated that it is possible for the aging and the mentally and physically handicapped to adjust themselves to competitive employment. (iii) A tremendous saving to the community. (iv) Assessment on the job by a trained counsellor, which yielded much information. (v) Social adjustments of greater value than many realize. (vi) Experience for rehabilitation counsellors and supervizors. (vii) An opportunity for the physician and the counselling psychologist to understand each other's work better. (viii) Experience for young physicians in training. (ix) Visits to the centre by employer groups. The authors describe the work of the centre in detail.

Medical Practice.

QUEENSLAND MEDICAL AND ASSOCIATE PROFESSIONS SUPERANNUATION PLAN.

The following reports make up the first annual report of the Queensland Medical and Associate Professions Superannuation Plan.

Founders' Report.

I am deeply conscious of the privilege and honour which is mine, as Chairman of Founders, in presenting this the *first annual report of the Medical and Associate Professions* Superannuation Plan.

This is a new venture and one which I feel sure will be a boon to professional men and women enabling them to provide adequately for their declining years.

The M.A.P. Superannuation Plan was first mooted in September, 1956. All the relevant information available relating to superannuation plans was carefully studied by *a special committee, and their recommendation was pre*sented to the Council of the Queensland Branch of the British Medical Association for its consideration. The Plan *was accepted in principle and a Trust Deed was drafted by* the superannuation consultant.

Four Founders and five Trustees were chosen by the Branch Council. They met on February 19, 1957, and after electing their respective chairmen the Trust Deed was signed and a copy was sent to the Commissioner of Taxation for his approval.

On May 23, 1957, the President of the Queensland Branch of the B.M.A. announced that the preparatory stages of the Plan had been completed with the blessing of the Branch.

Although primarily created for self-employed members of *the medical profession, invitations were extended to five* associate professions to join the Plan, and the Trust Deed was so framed that its scope could be widened if subsequently decided by members of the Plan.

Following the end of the 1957 financial year enrolments were slow but steady. The Founders and Trustees were fully conscious of the necessity to enforce rigid economy during the building of the Plan, and it was considered inadvisable to involve the Plan in an expensive advertising campaign. Nevertheless, every opportunity was taken to make members aware of the existence of the Plan and of the excellent opportunities it offered to provide for their retirement needs.

As was anticipated, excellent enrolments were received in *May and June, 1958.*

The relationship as between Founders and Trustees has *been a very happy one.*

All meetings, be they primarily of Founders or Trustees, have been attended by both groups. It was felt that at *least in the initial stages of the Plan full responsibility* should be accepted and shared by Founders and Trustees alike for all decisions made.

Some concern has been expressed by contributors to the Plan as to whether withdrawal of superannuation benefits after reaching 65 years of age is conditional on complete retirement from practice. It is correct that benefits under the present Deed and Rules are payable only after 65 years, conditional on complete retirement from practice (Rule 1 (c) and 6).

The Founders and Trustees realize that this may not meet the wishes of all members and intending members of the Plan.

However, the Founders and Trustees, after obtaining authoritative advice, are confident that the condition, i.e., complete retirement after 65 years, is not required by the Taxation Commissioner. If members so desire, approval can be sought from the Taxation Commissioner and appropriate steps can be taken to effect the necessary alteration to the Deed and Rules of the Plan.

It is of interest that a recent ruling by the Commissioner of Taxation confirmed that benefits withdrawn whilst still working were exempt from income tax.

Furthermore, a member may continue to make payments into the Plan above the age of 65 years, providing that more than one-half of his income still comes from the practice of his profession (Superannuation Consultant's letter dated July 14, 1958).

The Founders and Trustees are aware that minor clarifications and adjustments of the Deed and Rules may be desirable. All such changes are subject to the approval of the Taxation Commissioner, to certain provisions of the existing Deed, and, of course, are subject to the necessary change being approved by a Special General Meeting.

The Founders acknowledge gratefully the immense services rendered to the Plan in its inception by its Superannuation Consultants, Messrs. J. E. Harding and Company.

I would like to extend my sincere thanks to my colleagues, both Founders and Trustees, for their sympathetic understanding, cooperation and help.

Founders.

G. C. H. Hogg, A. E. Lee, L. J. J. Nye, Norman Sherwood.

(Signed) Norman Sherwood,
Chairman.

Trustees' Report.

Trustee duties, other than those connected with the formation of the Plan, commenced in earnest in May-June, 1957, when initial contributions were received and investments made.

From July, 1957, until April, 1958, there were small regular monthly investments to provide for, but in May-June, 1958, *contributions were heavy.*

Procedure for discussing investments takes the following pattern: Expert advice from bankers and financiers is presented to the meeting. The Founders, who attend each Trustees' meeting, are asked for their suggestions and recommendations, and thus act in an advisory and consultative capacity to the Trustees, in all matters relating to the investment of Plan moneys. The final decision rests with the Trustees.

You have before you a copy of the income and expenditure account and balance sheet for the year ended June 30, 1958, and it will be seen that contributions, less temporary assurance premiums, exceed £27,000 from 135 members, including 12 interstate and 10 from other professions. This *is a good start, but it will be readily understood that there* is and must be a lag before investments are made and a much greater delay before dividends and interest from *investments is forthcoming.*

Contributions during May and June, 1958, amounted to just under £15,000, and dividends and interest therefrom *will not be received for some months.*

The amount of dividends, interest, etc. (£550), accrued to June 30, 1958, is considered to be satisfactory. Apart from new contributions, a return of over £1500 is expected in the next financial year.

During the early growth of the Plan the "team" of Founders and Trustees has constructed an investment policy, and our aim is clearly defined.

It will be understood that investments must be widely spread in sound stock, some of which is purchased for an immediate high return and some bearing a lower yield with possible capital accretion and the probability of growth later on. At no time will any question of investment in stock other than those recommended by authoritative and responsible bodies be considered.

Stocks held as at June 30, 1958, are: Australian *Consolidated Industries Limited, Australian Guarantee* Corporation Limited, Amalgamated Wireless (Australasia) Limited, Australian Paper Manufacturers Limited, *Australian Fertilizers Limited, Allied Mills Limited,* Associated Securities Limited, Bearing Service (Holdings) Limited, Brisbane Gas Company Limited, Broken Hill *Proprietary, Brisbane Permanent Building and Banking* Company Limited, Commercial and General Acceptance Limited, Custom Credit Corporation Limited, Davies Coop. *Limited, Esanda Limited, Email Limited,* Evans Deakin and Company Limited, General Industries Limited, Humes Limited, Industrial Acceptance Corporation Limited, Lark Neave Carter Industries Limited, Mount Isa Mines Limited, North Australian Rubber Mills Limited, National Bank of Australasia Limited, Pauls Limited, Queensland Cement and Lime Company Limited, Queensland Can Company Limited, Southern Electric Authority of Queensland, Samuel Allen and Sons Limited, Swift and Company Limited, York Motors (Holding) Limited, Woolworths Limited, Walter Reid and Company Limited.

When the Plan was first envisaged, it was estimated that on the first year's operations a return of 1·5% to members should prove a reasonable result. It is pleasing to report *that this figure is 3·16%.*

When members study individual returns they are reminded that in many cases members have derived life assurance cover and so do not necessarily show an excess credit in their account as compared to contributions.

The present number of contributors ensures the success of the Plan, and as new members become enrolled resultant expansion will produce greater benefits.

In conclusion, the success of the Plan in its first year of operation has far exceeded expectations.

The reasons are obvious:

1. Prospective members can readily see the advantages of legitimate avoidance of income tax offered by the Plan in respect of (a) moneys paid into the Plan, (b) income earned by the Plan on its investments and (c) the emergent benefit.

2. The benevolence of the Queensland Branch of the British Medical Association, through the medium of the British Medical Agency, which carried on the work of the Plan at less than cost.

3. The fact that Founders and Trustees act as "Directors" in a completely honorary capacity.

4. The exercise of rigid economy by the Trustees and management in relation to all Plan expenditure.

5. This report would not be complete without a grateful reference to the work done by Mr. S. N. Cobbold and his Agency staff in administering the Plan.

Mr. Cobbold has been most assiduous in his attention to every phase of Plan activity. Founders, Trustees, and especially members are greatly indebted to him for all the work that he has done for the Plan from its conception onward.

Trustees.

J. R. Adam, B. N. Adsett, Robert Miller, J. G. Wagner.

(Signed) J. G. WAGNER,
Chairman.

(Signed) NORMAN SHERWOOD,
Chairman of Founders.

Medical Matters in Parliament.

SENATE.

THE following extract from *Hansard* relates to the proceedings in the Senate on February 26, 1959.

Pharmaceutical Benefits.

SENATOR COLE asked the Minister representing the Minister for Health, under notice:

1. Is it a fact that Tolbutamide tablets, which are easy to take, are now largely used in lieu of insulin, which is not as simple or acceptable since it has to be injected?

2. Is it also a fact that although the tablets constitute a life-saving drug, they are beyond the means of many people as they are priced at 9d. each and should be taken three or four times a day?

3. In the interest of sufferers from diabetes, will the Minister have these tablets placed on the list of free medicines?

SENATOR HENTY: The Minister for Health has now furnished the following reply:

1. No. Tolbutamide tablets have a limited use in the treatment of diabetes, being restricted to certain types.

2. The tablets cost approximately 6d. each, and the dosage is from one to four tablets per day, with the average at two tablets per day.

3. The question of the inclusion of these tablets in the list of pharmaceutical benefits is at present under consideration.

HOUSE OF REPRESENTATIVES.

THE following extracts from *Hansard* relate to the proceedings of the House of Representatives on February 26, 1959.

Port Moresby Hospital.

MR. TIMSON: Can the Minister for Territories tell the House whether the new general hospital at Port Moresby has yet been completed? If it has not, can he say when it will be opened and ready for use, and can he give us some information as to the total cost of the hospital?

MR. HASLUCK: The hospital at Port Moresby, in the Taurama Road district, is one of a series of base hospitals that we are building in the Territory. It was built in two stages, the first one being the native wing and the central services block, and the second one the European wing. The native wing was occupied during 1957, and the European wing was occupied in May, 1958, and finally handed over complete in August, 1958. I think the House will recall that our former colleague, the then Treasurer, Sir Arthur Fadden, performed a ceremonial opening in October, 1957, and we regard that as the opening of the whole hospital. The cost of the completed hospital was a shade under £1,000,000. From memory, I think it was about £960,000, the cost being almost equally apportioned between the native wing and the European wing. We have certain plans for the future, including the construction of a medical school, and we are hoping that the first stage of that school will be included in our works programme for next year.

Spider Bites.

MR. WHEELER: I direct a question to the Minister for Health. I expect the Minister has noticed that there has been a number of deaths recently in Sydney and its immediate environs as a result of funnel-web spider bites. A degree of hope exists that the Commonwealth medical research authorities may discover an anti-venene for use in cases of spider bite. Can the Minister say whether any progress has been made in this direction?

DR. DONALD CAMERON: A considerable amount of work has been done in the Commonwealth Serum Laboratories in an endeavour to find anti-venenes to the poison injected in bites by Australia's two poisonous spiders, the redback and the funnel-web. The experiments with regard to the redback spider anti-venene have been very successful, and a highly potent anti-venene has been elaborated. The experiments directed to the production of an anti-venene for funnel-web spider bite have not been very successful. In order to develop an anti-venene it is necessary to get an antigen response in an animal injected with the poison and to produce the anti-venene from its blood serum. This has not proved possible in the case of the funnel-web poison, but it is hoped that an antidote, in the form of some pharmacological substance, which may counter the venom, will be ultimately discovered. However, it is probable that a good deal more work will have to be done before that is achieved.

Poisons.

MR. WHITLAM asked the Minister for Health, upon notice:

1. When did the National Health and Medical Research Council recommend uniform requirements for the labelling and packaging of poisonous substances?

2. When were the council's recommendations transmitted to the State Governments?

3. Which States have amended their legislation to comply with the recommendations, and when did the legislation come into operation?

DR. DONALD CAMERON: The answers to the honourable member's questions are as follows:

1. In December, 1953, the council appointed a committee to prepare draft uniform poisons schedules to eliminate inconsistencies embarrassing to interstate trade. The committee presented its report in May, 1956, and was directed to confer with industry. Substantial agreement with industry having been achieved, the final report was presented in May, 1957.

2. May, 1957.

3. Queensland, September 15, 1958. Other States have reported progress in the drafting of the necessary amendments to the law.

Repatriation Pensions and Lung Cancer.

MR. CLYDE CAMERON asked the Minister representing the Minister for Repatriation, upon notice:

1. How many applicants suffering from lung cancer have been (a) granted and (b) refused a war pension since 1949?

2. How many of these applicants served in World War I?

3. Will the Minister prepare a summary of the reasons for refusing war pensions to applicants suffering from lung cancer?

Dr. Donald Cameron: I am advised by the Minister for Repatriation that statistics are not maintained of the number of ex-servicemen who have been granted or refused a war pension in respect of incapacity resulting from cancer of the lung. With regard to 3. of the question by the honourable member, I am advised by the Minister that a repatriation board or the Repatriation Commission only rejects a claim for pension in respect of incapacity resulting from lung cancer when the board or the commission is satisfied that the incapacity is not due to war service.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

HOSPITAL ECONOMICS.[1]

[From the *Australasian Medical Gazette*, February, 1883.]

Some absurd correspondence between Sir H. Parkes and Miss Nightingale has revealed what mere vanity may lead even a seasoned politician into: and also the poverty of the literature of hospital economics. Miss Nightingale, with the facilities she enjoys in connection with the work of her life, and her acquaintance with medical celebrities, could not discover a solitary work on the subject. If Sir Henry ever reads the newspapers which, though an old pressman himself, he of late has taken pains to inform the world he does not, he would have known that the information he asked for had been placed on his breakfast table months before in Sydney, and was kept filed in the Institution, for whose benefits, most particularly, he was asking for it. With the exception of the production in question—on hospital management—previously read at a meeting of the New South Wales Branch of our Association, and a work by a Government practitioner in London, the literature of this subject is very scanty, as Miss Nightingale truly remarks.

Correspondence.

ROBERT GORDON CRAIG.

Sir: Mr. Earlam's interesting paper on R. Gordon Craig (Med. J. Aust., January 24, 1959) brought to the minds of those who remember him a vivid picture of that colourful personality. With the passage of years Craig's stature has increased, his great works having vigorously outlived the personal foibles which rather held the attention during his lifetime. Mr. Earlam outlined Craig's great gifts to the surgery of this country, which are indeed worthy to be remembered by all Australian surgeons.

Though it is a matter of historical detail only, I should like to amplify the statement concerning his final great benefaction to the Royal Australasian College of Surgeons. It is a fact that the Council of the time hoped to devote some of the bequest to purposes of research, but this was not because of any instructions or restrictions in the terms of Craig's will, and it was in fact never done. Gordon Craig's benefaction was wonderful enough, but the complete absence of strings or restrictions made it so much more valuable to the young College.

In fact, the Council has used the Craig income to maintain and enrich the library called after him, and the important service it provides to fellows. The money has been used also on many of the normal important functions of the College and by investment to increase the corpus. Interest accumulating during the inactive years of the war was used subsequently in the form of scholarships known as "Gordon Craig", which helped many young surgeons after active war service to enter specialist training.

How much more helpful this has been to the young College and to the structure of the surgical specialty than money sequestered for research! "Research" in an institution such as the College is so apt to become ad-hoc investigations undertaken as a matter of policy or expediency by one not really gifted or trained for the conception and trial of original thought, and so a great benefaction may be dissipated.

The first purpose of the College is to maintain and improve the standards of surgery, and to build up a machinery for the complete post-graduate achievement of standards in experience and basic knowledge.

Craig's faith in the mission of the College has done more than we can realize to make this possible, and without him it may never have been possible, for there have been no other Craigs.

He set a noble example of public generosity, vision and trust in the authoritative surgical body of Australasia. It is a lead which all who have a sincere love for the calling of surgery should feel an urge to follow, for the College has grown to a great importance and to an ever-increasing responsibility in the community, and only men with Craig's broad outlook and faith can help in the realization of its high ideals.

Yours, etc.,

149 Macquarie Street, Sydney, March 4, 1959.

Douglas Miller, F.R.A.C.S.

OSTEOARTHRITIS AND LUMBO-SACRAL PAIN.

Sir: Referring to the letter from Dr. E. Haslett Frazer in the issue of January 31, 1959, on the above matters, I would like to point out that I have not indulged in medical Press correspondence for many years; but I feel that the importance of these particular subjects demands that knowledge and experience gained in relation thereto should be disseminated as widely as possible. In the main I agree wholeheartedly with the contents of Dr. Frazer's letter, and particularly with the last paragraph thereof. I would like all medical men to get hold of that issue and re-read it.

I wish to join issue with him as regards manipulation of backs under anæsthesia. Everyone must admit without question that the function of joints is to enable some parts of the body to move on other parts. If any joints suffer trauma, either inflammatory or traumatic, they are protected as a rule by muscle spasm, certainly in the acute and early stages. As the condition subsides the joints are gradually used by the patient and recovery may ensue, especially in the young. In the middle-aged and older it is quite common to find that a joint has not regained its full range of movement following trauma, and without special encouragement it will not do so. In the majority of cases the patient's own movements and exercises are sufficient to restore movement if faithfully applied. In some cases additional help is required, and this is afforded by skilful physiotherapy consisting of heat, active assisted movements and manipulations. But there are some who do not respond to either; pain and restriction of activity persist. In these cases, if there are no contraindications, manipulation under anæsthesia is essential. Many joints can be manipulated without anæsthesia, but in backs it is extremely difficult at times. Having been hurt once by a manipulation, it is almost impossible to get the patient to relax sufficiently to produce a full range of movement of any particular joint or joints. Hence, the necessity for anæsthesia. "Pentothal" *plus* relaxant is the most delightful form of anæsthesia, and the people come back for more if necessary without demur. This most definitely is not "blind" therapy.

Manipulation is an art, and all that is required of a manipulator is anatomical and pathological knowledge of the region, a clear vision of the particular pathology involved and the skill to perform the manipulations indicated. No force is used and no damage is likely to ensue. Knowledge and know-how are the handmaidens of the successful manipulator, and it follows that manipulations must be performed only by those who have acquired the necessary knowledge and skill, if success is to be the reward.

Dr. Frazer proceeds to talk about intraarticular therapy. Here, I think, the tables are turned. Injecting various magic fluids into a joint can, in my opinion, do but little good. What good is done is through the realms of psychotherapy, I am sure. This, in my opinion, is "blind" therapy.

In regard to Dr. Frazer's reference to Mr. Tom King's paper, I must confess that I am on Dr. Frazer's side. I would like to emphasize, for the benefit of all budding

[1] From the original in the Mitchell Library, Sydney.

orthopædic surgeons, that a spinal fusion is not a simple operation, nor is it uniformly successful. In the best hands at the most 70% of cases are really successful. Failure can be due to inadequate bony fusion, and also to misdiagnosis and hence improper selection of cases. Accurate diagnosis in this anatomically complicated area is extremely difficult, and it is essential for the surgeon to have a broad and clear vision of the many pathological conditions which could exist. Tissue tension occurs in the most simple cases, but is often overlooked. I have recently been in communication with Mr. W. E. Tucker, of London, on this subject, and he, an acknowledged expert in this line, confesses that we are very ignorant of its ramifications and of the methods for combating the same. Much more knowledge and a very broad-minded outlook is required, and I join with Dr. Frazer in hoping that somebody will start something to try and solve these problems.

Yours, etc.,

224 St. George's Terrace, R. D. McKELLAR HALL.
Perth,
Western Australia.
March 3, 1959.

THE HÆMOPHILIAC AT SCHOOL.

SIR: The Hæmophilia Society wishes to announce that its recent pamphlet, "The Hæmophiliac at School", is available to doctors on request. The Society has supported the recommendation given it that hæmophilic children should obtain their education by attending ordinary schools. The pamphlet answers many of the problems associated with this recommendation, and it was written for the benefit of parents and more particularly for teachers, describing what the condition is and how it affects the child. It also gives answers in general terms as to ways by which injuries may be prevented, what immediate care is required in emergencies, etc.

In order to foster doctor-patient relationships, the Society thought that doctors caring for hæmophilic children who are not members of the Society might prefer to pass this pamphlet on to the parents, rather than their hearing about the Hæmophiliac Society through the lay Press. At the same time, doctors would have an opportunity of obtaining some knowledge about the Society.

Yours, etc.,

B. M. SCOLES,
Secretary.

5 Bickleigh Court,
Glen Iris,
Victoria.
March 3, 1959.

ACUTE OTITIS MEDIA IN CHILDREN.

SIR: In a well-written paper in your Journal of February 28, 1959, Patricia Davey, Clair D. Chalmers and Minna Golomb, of the Royal Alexandra Hospital for Children, Sydney, have failed to mention the most important weapon available to us in the treatment of the above condition. I refer to the therapeutic use of short waves, which I have employed for over 20 years in the treatment of acute otitis media. Not in one case during this period have I performed myringotomy, nor have I referred a case for this procedure. On occasions I have suffered embarrassment in consultation in advising against the operation.

The old adage, "where there is pus let it out", no longer holds in the presence of short wave correctly given, and this applies to suppuration in any part of the body providing the offending pathogen reproduces itself by binary fission. Pathogens falling into this category are the *Staphylococcus aureus*, the *Streptococcus viridans*, the *Streptococcus hæmolyticus* and the *Pneumococcus*, all of which are vulnerable to short-wave therapy in acute suppurative and non-suppurative inflammation. Before I encroach further on your space, I want to sound a note of warning and state categorically that no patient should be referred to a physiotherapist for treatment of acute otitis media unless a qualified medical practitioner is in personal attendance, and more, that such a doctor has special qualifications as a diagnostician and one who understands full well the use of short-wave apparatus.

The current opinion is that short wave produces heat, and that heat in this form causes vasodilatation and hyperæmia. Experiments carried out by myself suggest that the reverse is the case—that is, that short waves produce vasoconstriction. One experiment which I carried out was to place the bar of the common shell fish (the mussel) in saline and expose it to short waves of low intensity, and view the effect under the microscope. The mussel appeared to contract like "a piece of bacon in a frying pan"; its cilia seemed to shrink, and at first movement was accelerated and later slowed. The field intensity was a power of 250 watts and three milliamperes intensity. If human tissue behaved similarly to exposure—and there is empirical evidence to support it—then I suggest there would be tissue contraction and vasoconstriction of arterioles. Further, I suggest that the effect of short waves upon a unicellular pathogen which replicates itself by fission (its chief weapon for survival) would be to slow it down, perhaps paralyse it and give the leucocyte its opportunity for destruction.

Every member of the teaching staff of our training hospitals, including dental hospitals, should study the above challenge to previously accepted therapeutic measures, and I am quite ready to stand my ground before any member or coterie of members of either profession to prove my contention.

The authors of this paper state that they treated 351 patients during 1957 for otitis media and 25 for mastoiditis. Forty cases of the otitis group were surgically treated and 33 mastoidectomies were performed. My claim is that surgery can be avoided in all children over three years of age—that is, children of an age capable of sitting in front of a short-wave unit. In employing short wave for acute conditions there is no occasion to give intense heat; this will increase the pain. With low milliamperage pain is usually relieved on the first day, and treatment is best given four hourly. Generally otitis media (acute), whether suppurative or non-suppurative, resolves in three to five days. Perforation of the tympanic membrane has not been observed as a sequela, nor have I found evidence of hearing loss. With the advent of the antibiotics I give these as supplementary treatment.

I am in agreement with many of the observations made by the authors, but not all. I disagree with their claim that the post-nasal space is the primary source of infection causing otitis media. In my opinion the paranasal sinuses are the original source of infection, and I base this opinion on radiological evidence. The X ray is practically 100% reliable as a diagnostic measure in maxillary sinusitis, but not in the other sinuses. Treatment of the sinuses is given concurrently with treatment of the otitis. The authors do not mention having taken an X ray of the sinuses in one single case, so apparently we are in disagreement, although engaged in the same field of medical endeavour.

Yours, etc.,

F. WILKIE SMITH.
207 Darlinghurst Road,
Darlinghurst,
N.S.W.
March 5, 1959.

MEDICAL TECHNOLOGY CONVENTION.

SIR: In his letter to your Journal of February 21, 1959, Dr. J. R. S. Douglas raises an important point of non-medical laboratory workers calling themselves pathologists or being referred to as pathologists by individuals who, at times, should know better. It has been noted in country centres where some hospitals employ a laboratory technician and are apt to spread abroad the idea that a pathologist is employed. Local newspapers and on occasion radio announcements give such misleading statements a wide coverage.

It seems a real need exists to devise a distinctive and suitable name for non-medical laboratory workers, so that there would be no excuse for the term "pathologist" to be given to people not medically trained. The sister specialty of radiology has the terms "radiologist" and "radiographer", perhaps with not quite wide enough or clear-cut distinction.

Nowadays the clinical pathologist is an exceptionally well-trained member of the medical profession (the diploma course is a three-year minimum), and he brings to all his medical colleagues valuable laboratory skill and wide knowledge of the significance of laboratory findings to the diagnosis of disease and often to the therapeutics of disease.

The clinical and technical articles of the general medical journals and the bewildering profusion of journals devoted to the many branches of pathology can only be digested—even if partially—by a medically trained laboratory worker—i.e., a pathologist. One has only to mention the vast aspects of modern hæmatology, the rapidly altering pattern of bacterially produced diseases changing under our eyes, the increase of viral conditions, the widening fields of bio-

chemistry and the birth of radioactive procedures. It is only the pathologist who can channel these into the practical everyday life of the profession at large.

As regards the Medical Technology Convention, it seems that displays of the same nature under the direction of the medical profession could be made a feature at medical congresses elsewhere.

While it is proper that a ban should operate to prevent individual medical men from taking part in lectures or demonstrations to the public, it would seem desirable for the profession as a whole to stage, on occasion, some form of exhibition whereby the profession could, without the melodrama of television or cinematography, bring before the public some of the basic progress in medical science, and the two main fields would seem to be radiology and pathology. Such demonstrations organized by the profession would have considerable value.

Yours, etc.,

S. R. Dawes.

83 Kite Street,
Orange,
N.S.W.
March 2, 1959.

PSORIASIS: A PHYSICIAN'S EVALUATION.

Sir: I must support Dr. Ward's plea (Med. J. Aust., February 21, 1959, page 276) that we should not come to regard psoriasis as a disorder which does not readily respond to treatment. Such a retrograde attitude is only one short step away from the even more dangerous belief that psoriasis is an incurable disease. To implant this thought in a patient's mind can do nothing but harm. It engenders indifference or hopeless resignation to the malady, and only increases the difficulties of treatment.

Dr. E. Susman (Med. J. Aust., January 10, 1959) mentions the regime of treatment used in the Leeds School. This is an effective routine which can be used in any institution where the facilities are available. In this country its use has been restricted, because the necessary out-patient space is seldom available, and the number of in-patient beds is very limited. The Leeds routine will not succeed in every patient who has psoriasis, but it will help a large proportion of them, especially if they will enter hospital and gain the added advantage of rest. This, of course, is one of the difficulties encountered. The patient is often unwilling to be admitted to hospital for treatment of a condition which is regarded as purely a cosmetic deformity.

It would be foolish to minimize the difficulties of treating any disorder in which the essential pathogenesis remains obscure; but a vigorous and optimistic approach to the treatment of psoriasis is liable to achieve more success than the adoption of the defeatist attitude that the disease is incurable.

Yours, etc.,

A. G. Finley.

235 Macquarie Street,
Sydney,
February 25, 1959.

WORK FOR THE HANDICAPPED.

Sir: Your leading article (Journal, February 28, 1959) gives publicity to this important topic; but it contains opinions which are debatable and not at once with your earlier editorial on the subject (Med. J. Aust., October 11, 1958). As you say, those competent for this field are not "specialists enthusiastic about treatment (to the exclusion of) reestablishment", nor yet those whose clinical experience is in question.

Again, your leader implies that "the authorities" should establish workshops; but others believe this would be unwise, even if feasible. Socialism in Britain controls the "Remploy" factories. Is there no better alternative for Australia? And your leader unjustifiably omits reference to the disabled workers' hostel and growing chain of sheltered workshops of the Civilian Maimed and Limbless Association operating under the experienced and inspiring leadership of Mr. and Mrs. Hugh Bedwin.

Your leader also overlooks the well-known fact that many handicapped people can best be found work, or trained for work, or at work, by specially recruited vocational counsellors, serving as the (rehabilitation) practitioner's right-hand man.

Progress now requires Federal finance, but this is not likely to be forthcoming on the basis of debatable suggestions.

Your leader indicates that the organized rehabilitation service of the Commonwealth has been in operation for more than a decade. What does it say on the matters raised? Your leader is also silent concerning the detailed deliberations of the Federal Council concerning rehabilitation and reemployment.

Finally, your leader might well have drawn attention to the alleged serious risk of intrusion into this sphere of medical rehabilitation and social security by the International Labour Organization. Bauer has warned that this body wishes to aim "to place doctors on the status of labour technicians . . . as full-time salaried servants of the social security bodies . . . to limit the doctor in his therapeutics [and the patient in his choice of work] to establish diagnostic and treatment centres under lay control; and even to modify medical education, so that the future doctors will be thoroughly inculcated with the social security philosophy". If the profession's spokesmen wish to preserve the best interests of the handicapped, as well as the nucleus of its noble ideals and freedoms, they must be well informed and sure of their principles before leading into the beckoning industrial-political wilderness.

Yours, etc.,

"Medicus".

Sydney,
March 6, 1959.

ŒSOPHAGEAL HIATUS HERNIA.

Sir: The radiological diagnosis of acquired œsophageal hiatus hernia became common in the post-war years and aroused the interest of clinicians and surgeons. Controversy soon developed as to repair techniques, especially as to the approach, thoracic or abdominal. There was remarkable diversity of reported operative results by different surgeons employing the same techniques, and it was realized by some that recurrence of the hernia and of symptoms was common after operation.

It is interesting to note the number of operations carried out over the years 1951 to 1958 for repair of acquired œsophageal hiatus hernia at Royal Prince Alfred Hospital, Sydney. The following figures were supplied by the Medical Records Librarian:

1951	7 operations
1952	12 operations
1953	13 operations
1954	15 operations
1955	16 operations
1956	10 operations
1957	4 operations
1958	3 operations

A peak occurred in 1954-1955, following which the popularity for this procedure has markedly declined. Of the three operations carried out in 1958, one patient died of a cerebral vascular catastrophe before leaving hospital and the follow-up notes of another indicate her pain was unrelieved.

It is evident that the operation for repair of an uncomplicated acquired œsophageal hiatus hernia is rarely indicated, with the possible exception of the large para-œsophageal variety. They can be satisfactorily controlled by conservative therapy. It would seem that surgery should be reserved for the serious complications.

Yours, etc.,

S. J. M. Goulston.

Royal Prince Alfred Hospital Medical Centre,
100 Carillon Avenue,
Newtown, N.S.W.
Undated.

Naval, Military and Air Force.

HONOURS.

The following announcement is published in the *Commonwealth of Australia Gazette*, No. 14, of February 26, 1959.

Her Majesty the Queen has been graciously pleased under date 4th February, 1959, to approve the appointment of the undermentioned officer in the capacity shown:

AUSTRALIAN MILITARY FORCES.

To be Honorary Surgeon to the Queen.

Colonel Edgar Frederick Thomson, M.B., Ch.B., F.R.A.C.P., F.R.I.P.H., M.C.P.A., Royal Australian Army Medical Corps, vice the late Colonel Robert Officer, M.B., B.S., F.R.C.S., F.R.A.C.S.

APPOINTMENTS.

THE following appointments, changes etc. are published in the *Commonwealth of Australia Gazette*, No. 14, of February 26, 1959.

AUSTRALIAN MILITARY FORCES.

Royal Australian Army Medical Corps (Medical).

3/12029 Captain P. Y. Kyle is transferred to the Reserve of Officers (Royal Australian Army Medical Corps) (Medical)) (Eastern Command), 5th December, 1958.

Citizen Military Forces.

Northern Command.

Royal Australian Army Medical Corps (Medical).—To be Captain (provisionally), 10th December, 1958: 1/39228 James Pietsch.

1/61807 Honorary Captain R. C. S. Jackson is appointed from the Reserve of Officers and to be Captain (provisionally), 6th November, 1958.

F1/1034 Captain (provisionally) J. A. Cleary relinquishes the provisional rank of Captain, 16th July, 1958, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Northern Command) with the honorary rank of Captain, 17th July, 1958.

1/46764 Major A. J. Kerr is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command), 25th August, 1958.

1/46933 Captain (provisionally) T. B. Buchanan relinquishes the provisional rank of Captain, 9th October, 1958, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Northern Command) in the honorary rank of Captain, 10th October, 1958.

1/46946 Captain (provisionally) R. N. Gale relinquishes the provisional rank of Captain, 22nd October, 1958, is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Northern Command), and is granted the honorary rank of Captain, 23rd October, 1958.

To be Captains (provisionally), 24th November, 1958: 1/61875 Kevin Dominic Francis Martin and 1/39227 William David Symes.

Eastern Command.

Royal Australian Army Medical Corps (Medical).—To be Captains (provisionally): 2/146624 Roger George Congdon and 2/111138 Serge Nicholas Protopopoff, 10th December, 1958, and 2/146625 Frederick Charles Hinde, 22nd December, 1958. 2/101562 Major J. V. Roche is appointed from the Reserve of Officers, 7th July, 1958. To be Captain (provisionally), 26th November, 1958: 2/267200 James Maurice Purchas.

Southern Command.

Royal Australian Army Medical Corps (Medical).—3/157155 Lieutenant-Colonel R. S. Lawson is appointed to command 2nd General Hospital and to be Temporary Colonel, 24th December, 1958.

3/157151 Colonel H. A. Phillips, E.D., relinquishes command 2nd General Hospital, 23rd December, 1958, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command), 24th December, 1958.

3/101012 Major C. F. Macdonald ceases to be seconded whilst in the United Kingdom, 1st June, 1958.

The following officers are transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command): 3/101836 Captain G. R. McLeish, 1st July, 1958, and 3/101012 Major C. F. Macdonald, 29th October, 1958.

Central Command.

Royal Australian Army Medical Corps (Medical).—To be Majors, 16th December, 1958: 4/32004 Captain D. D. Beard and 4/32070 Captain (Temporary Major) A. K. Grant.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED FEBRUARY 28, 1959.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	4(1)	3(3)	7(4)	..	..	..	..	..	14
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	..	..	..	..	3	..	3
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	1	..	..	..	..	..	..	..	1
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	3(2)	16(16)	2(2)	..	..	..	4	1	26
Diphtheria	..	1(1)	..	..	..	..	..	..	1
Dysentery (Bacillary)	..	4(1)	1(1)	1(1)	..	..	..	..	6
Encephalitis	..	..	1(1)	..	..	..	..	..	1
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	80(29)	35(14)	13(4)	10(1)	2(1)	2	3	1	152
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	..	..	..	..	..	..	..
Leptospirosis	..	..	1	..	..	..	..	..	1
Malaria	..	..	..	..	..	..	..	..	..
Meningococcal Infection	..	..	..	..	..	..	..	..	..
Ophthalmia	..	..	..	..	4	..	..	..	4
Ornithosis	..	1	..	..	..	..	..	..	1
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	..	..	..	..	..	..	..	..	..
Puerperal Fever	..	..	..	..	1(1)	..	..	..	1
Rubella	..	10(15)	..	4(4)	7(7)	..	1	..	31
Salmonella Infection	..	..	..	..	4(4)	..	..	..	4
Scarlet Fever	10(3)	23(16)	2(2)	4(1)	1	3	2	1	46
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	..	..
Trachoma	..	..	..	..	10	..	9	..	19
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	38(27)	17(11)	31(29)	3(2)	5(4)	2	1	..	97
Typhoid Fever	..	1(1)	..	1(1)	..	..	..	..	2
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	..
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

F4/1171 Captain R. L. Dow is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Central Command), 3rd December, 1958.

Tasmania Command.

Royal Australian Army Medical Corps (Medical).—To be Majors, 26th November, 1958: Captains (Temporary Majors) 6/15379 K. S. Millingen and 6/15388 R. J. Connolly.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps (Medical).

Southern Command.—The resignation of Honorary Captain W. A. Bossence of his commission is accepted, 29th October, 1958.

Post-Graduate Work.

ROYAL PRINCE ALFRED HOSPITAL: EAR, NOSE AND THROAT DEPARTMENT.

Seminar Programme, 1959.

The staff of the Ear, Nose and Throat Department will conduct a seminar on the second Saturday of every month at 8 a.m. in the Scot Skirving Lecture Theatre, Royal Prince Alfred Hospital. The main speaker will not exceed forty minutes, and there will be a discussion at the conclusion of his remarks. All medical practitioners and clinical students are invited to attend.

At the next seminar, to be held on April 11, 1959, Dr. J. H. Seymour will speak on "The Significance of Cervical Sympathectomy in the Surgery of the Ear".

Australian Medical Board Proceedings.

QUEENSLAND.

The following have been registered, pursuant to the provisions of Section 19 (1) (a) and (c) of *The Medical Acts*, 1939 to 1955, of Queensland: Johnson, Leslie Bruce, M.B., B.S., 1957 (Univ. Queensland); Lowrey, Joan Margaret, M.B., B.S., 1957 (Univ. Queensland); Noblett, Helen Rae, M.B., B.S., 1957 (Univ. Queensland); Acheson, Thomas Frederick, M.B., B.S., 1957 (Univ. Melbourne); Gordon, Richard Douglas, M.B., B.S., 1957 (Univ. Queensland); McLeod, George Roderick Cooper, M.B., B.S., 1957 (Univ. Queensland); O'Collins, James Patrick, M.B., B.S., 1957 (Univ. Melbourne); Brennan, Colin Kenneth, M.B., B.S., 1957 (Univ. Queensland); Grice, Melody Joy, M.B., B.S., 1957 (Univ. Queensland); Brown, Robert Rowland Edkins, M.B., B.S., 1957 (Univ. Queensland); Morrow, Colin Arthur, M.B., B.S., 1957 (Univ. Queensland); Porter, Geoffrey Thomas James, M.B., B.S., 1957 (Univ. Queensland); Young, Leonard Neville, M.B., B.S., 1957 (Univ. Queensland); Ryan, Peter James, M.B., B.S., 1958 (Univ. Sydney); Cohen, David Julius, M.B., B.S., 1957 (Univ. Queensland); Cary, Jill Maude, M.B., B.S., 1957 (Univ. Queensland); Comerford, John Anthony, M.B., B.S., 1957 (Univ. Queensland); Barr, Alan Marshall, M.B., B.S., 1957 (Univ. Adelaide); Delaney, James Joseph, M.B., B.S., 1957 (Univ. Queensland); Douglas, Barbara Marion, M.B., B.S., 1957 (Univ. Queensland); Cairns, Peter John; Kerr, John Foxton Ross, M.B., B.S., 1957 (Univ. Queensland); Roberts, Sydney James John Cecil, M.B., B.S., 1957 (Univ. Queensland); Turner, Bernard Godfrey, M.B., B.S., 1958 (Univ. Sydney); Deegan, Robert James, M.B., B.S., 1958 (Univ. Sydney); Thompson, Graham Stuart, M.B., B.S., 1957 (Univ. Sydney); Young, Ian Frederick, M.B., B.S., 1957 (Univ. Sydney); Balandin, Russell, M.B., B.S., 1957 (Univ. Sydney).

The following have been registered, pursuant to the provisions of Section 19 (1) (a) and (d) of *The Medical Acts*, 1939 to 1955, of Queensland: Mitchell, Robert Mervyn, M.B., Ch.B., 1950 (Univ. New Zealand), Ch.M., 1957 (Univ. New Zealand), F.R.C.S., England, 1952; Mitchell, Ruth Evelyn, M.B., Ch.B., 1950 (Univ. New Zealand), D.C.H., London, 1953; Champion, Maret, M.B., B.S., 1951 (Univ. Sydney), D.C.H., London, 1955; Patterson, Margaret Matilda, M.B., B.S., 1950 (Univ. Melbourne), D.A., R.C.P., London, R.C.S., England, 1955, F.F.A., R.A.C.S., 1958.

The following additional qualifications have been registered: Hemsley, James Bleakley, M.R.C.O.G., London, 1958; Masel, John Philip, M.R.A.C.P., 1958; McClymont, Donald Hugh, F.R.C.S., Edinburgh, 1958; Nimmo, David Bruce, F.R.F.P.S., Glasgow, 1958; Lusby, Henry Lindsay John, F.R.C.S., Edinburgh, 1957, F.R.C.S., England, 1957; Waga, Irene, D.P.M., 1958 (Univ. Melbourne); Hodges, Douglas James, M.R.C.P., Edinburgh, 1958; Pigott, Louis Joseph, F.R.C.S., England, 1958.

Deaths.

The following deaths have been announced:

Wynne.—Thomas Gillis Wynne, on March 16, 1959, at Melbourne.

Fitzgerald.—Charles Edward Fitzgerald, on March 20, 1959, at Auburn, New South Wales.

Diary for the Month.

April 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
April 9.—New South Wales Branch, B.M.A.: Public Relations Committee.
April 10.—Queensland Branch, B.M.A.: Council Meeting.
April 10.—Tasmanian Branch, B.M.A.: Branch Council.
April 13.—Victorian Branch, B.M.A.: Finance Subcommittee.

Medical Appointments: Important Notice.

Medical practitioners are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

All articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations, other than those normally used by the Journal, and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those of the list known as "World Medical Periodicals" (published by the World Medical Association). If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to The Medical Journal of Australia alone, unless the contrary is stated.

All communications should be addressed to the Editor, The Medical Journal of Australia, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

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